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The "Encyclopédie d'Architecture." Vol. II.

THE second volume of M. Planat's great work* is already complete, so that it seems to get on fast, and we hope will continue to do so, for nothing is more heartrending to readers and subscribers than a dictionary which drags its slow length along year after year, and seems destined never to reach its close. The latter half of the second volume, reaching from *Béton* to *Cavet*, includes long essays on subjects so wide apart as "Cabinet d'aisance" and "Cathédrale," between which are found such suggestive subjects as "Bibliothèque," "Blois," "Byzantine," "Cannelures," "Capitole," and "Caryatide."

The article "Cathédrale," which has the signature of the editor, is one of the longest and most important in the volume. Pointing out in the first sentence the derivation of the word from the *cathedra* or chair of the bishop (a derivation, obvious as it is, habitually forgotten by the public at all events), M. Planat alludes in passing to that union between the clerical and the royal interests in the France of the twelfth century which, as already pointed out by Viollet-le-Duc, had been such an influence in promoting the development of ecclesiastical architecture in the country. Returning to the wider aspect of the subject, however, he gives in an interesting series of comparative plans a sketch of the development of the basilica form into the plan of the Early Mediæval period. The plans illustrating this development are those of Sta. Agnese without the walls, Sta. Maria Maggiore, Saint Paul without the walls, Cérisy-le-fôret, Mans, the early Trèves Cathedral, the later one, Verdun, Cluny, Clairvaux, and Pontigny. Most of these are plans retaining more or less the basilica form, or at least in which that form is predominant, and the author suggests the grouping of the plans of cathedrals historically as (1) those that are directly derived from the basilica form; (2) those which are still basilican in idea but in which the transepts are more or less developed; then, among the completely transeptal plans, we distinguish between those in which the apse is only the width of the centre aisle of the nave, and those in which the apse extends over the whole width of the nave and side-aisles: and lastly we have to distinguish between apses with radiating chapels and those that are without. This is a tolerably methodical classification, and is illustrated in detail by a considerable number of further plans, and by views and sections of various cathedrals. The illustrations include views drawn in line, somewhat hard in style, but precise and clear, and a certain number of sections, drawn to a small scale but carefully finished and giving a very good idea, even on this scale, of the bold "stone scaffolding" construction of many of the French Cathedrals, and the enormous masses of masonry piled up as counterforts which gave such marked character to the Early Gothic architecture of France. Of the cathedrals with the larger apse Rheims and Amiens are of course typical examples. That of the cathedral of Mans is adduced as a remarkable example of a case in which there is a very elaborate development of the apsidal choir and the radiating chapels (which in this case stand out further than usual from the main wall of the apse), while the transept retains the simpler and earlier form with a single aisle only. This no doubt gives a singular appearance to the plan, which is a curious illustration of the amount of artistic effect and expression which may be embodied in a mere plan, and it is certainly strange to think that there is only about thirty or forty years between the exceedingly simple Romanesque transept plan and the ambitious *tour de force* of the choir plan. M. Planat explains this by the very fact of the great elaboration of the choir structure, which necessitated leaving the old plain transept as a kind of buttress to it; but though it certainly has this effect both on plan and in the view, and contrasts most effectively with the choir architecture, we should very much question the existence of any deliberate intention of contrast of this kind on the part of the builders of the choir. Constructively they may have thought it more prudent to let the transept alone, with a piece of construction in the choir which must have given them quite enough to think of.

Among the square-ended cathedrals, which form yet another class, M. Planat compares Laon and York as presenting a great deal of analogy on plan; there certainly is a striking resemblance between the two in general arrangement and character. The writer adds that among the cathedrals with the square east end on plan there seems for the most part to be a certain degree of repetition of the same squareness and angularity of line in the general design; a piece of criticism which has a good deal in it, and is in accordance with actual fact and with the probabilities of architectural conception of a building as a whole. The builder who devises a florid and complicated plan will be likely, by the very same impulse, to seek variety and elaboration in the general outline of his design.

The article by M. Planat, though illustrated by a number of views, is confined really to this analysis of cathedral plan, and affords a good *résumé* of this portion of the subject; other branches of it being treated under other headings. The article "Bourse" is of some interest, especially for the illustrations of the exterior and interior of the Bourse at Valence; the exterior illustration is, it is true, an unfortunately hard and wiry drawing of a building which demanded a much more picturesque treatment, but the interior, with its remarkable ranges of thin twisted columns from which the vaulting ribs spring with nothing but a small necking to mark the impost, is well drawn and makes one of the most interesting illustrations in the book. This is marred to some extent, unfortunately, by the hard ruled lines of "shading" on the floor, a treatment constantly repeated in the illustrations, the interior view of the Bourse of Antwerp having the floor completely covered with a network of lines ruled parallel across the picture one way, and to the vanishing-point the other way, apparently intended to represent the flooring slabs; a most puerile method of drawing, or we should think so in England. Our draughtsmen have recently taken to rather over-doing the "play of light-and-shade" business in ink-line drawings, so that in some cases it rather looks as if the object were to see how much of the drawing could be left to the imagination; but at least the effect is more artistic than this hard mechanical lining-up practised by French draughtsmen, who seem never to have arrived at anything like a picturesque or artistic use of ink-line drawing, though they are pre-eminent as colour draughtsmen. The view of the Bourse at Paris, with its square lines and formal Classic peristyle, seems a sad descent from the picturesqueness of Valence; but it may no doubt be argued that this design correctly expresses (though in sham-antique language) the idea of the modern Bourse, as laid

* Encyclopédie d'Architecture et de la Construction. Directeur: P. Planat. Vol. II. Paris: Dujardin et Cie.

down by M. Benouville, the author of the article, as being simply "une grande salle rectangulaire." We have here, says M. Benouville, "a problem always new; how to cover in a large area without a heavy or heavy-looking roof; and perhaps when the present taste for iron has a little cooled down, we may return to the employment of light timber constructions for the roof, in which the last word has perhaps not yet been said" in the language of architecture.

The article on the subject of "Cabinets d'aisance," by M. L. Masson, is well done and well illustrated, and the author shows himself acquainted with what has been done in England for the improvement of this class of sanitary apparatus, and does full justice to the superiority of England to any other European nation in these matters; he says, indeed, to "other nations" generally, from which it would appear that he is not acquainted with the condition of American sanitary science, which in its turn may be said to be ahead of us in some respects. M. Masson admits (a remarkable admission for a French writer) that England has left France far behind in sanitation, an admission which we saw made the other day in a very practical manner in the advertisement of a French hotel, which numbered among its attractions "English water-closets." An elaborate and largely-illustrated article is devoted to "Bibliothèque." This subject is treated partly in a short historical sketch of the development of the library in ancient times; but in the main the tendency of the article is in accordance with the remark at the commencement, that the Bibliothèque is essentially the habitation or dwelling-place of books, and a good deal of attention is given to the practical question of the best and most preservative manner of housing books. In this respect the author, M. E. Camut, speaks well of the arrangements of the British Museum bookstores, which he has evidently examined carefully and of which he gives a tolerably detailed description, with diagrams. Plans are given of the British Museum Library, and of that at Washington, with its central octagon reading-room, which seems to be better planned for communication between the reading-room and the stores than our Museum, as there are connexions between the two departments on every side of the octagon, and not, as in our Museum, at one point only. Of course this does away with the benevolent arrangement of the Reference Library of books open to all without any preliminary formality, which is one of the great blessings of the British Museum Library, though one that is disgracefully abused by readers devoid of conscience or of respect for their fellow-men, who remove dictionaries from the shelves for a few minutes' reference and never replace them for the whole day; an abuse which cries for stringent action on the part of the authorities. The Stuttgart Library seems very badly planned for getting at the books, which are in an almost separate block of building. The plan of the Berlin Library is also given, and views of a good many library interiors, among which, of course, the Bibliothèque Nationale occupies by far the largest place; among others a view of the Birmingham Reading-room finds place. M. Camut, however, does not say anything as to the arrangement of light for reading, nor does he insist specially on the importance and difficulty of thorough ventilation of a library, both for the sake of readers and books. In this respect it would appear that the books at the British Museum are better cared for than the readers,—at least it is to be hoped so.

The subject of barracks, "Casernement," is ably treated in a long article with many illustrations, by MM. A. de Rochas and G. Espitallier. This is a subject that has not been much treated in architectural publications, and the article will be found of interest. The authors of this also seem to imply that in England and Germany the sanitary construction and arrangement of barracks is in a better condition than in France, which they account for partly because in England we have but a small number of troops to house and can afford to arrange thoroughly for their sanitation (he possibly has not heard of Dublin), and in Germany "le trésor de guerre offrait des ressources considérables"; an apparently half cynical reflection. The article "Caryatides" is well written and finely illustrated in outline drawings very carefully executed, and that on "Cannelures," by M. Adrien Joigny, is an admirable one, going into the æsthetics of the subject, the effect of flutings on architectural expression, the best forms of profile &c., in that truly architectural spirit which sees importance in the proper perfecting of even the minor details of architectural design. The article on "Bronze," by M. Rümler, is a good one both in a practical and artistic sense, and is illustrated by some fine examples, as also is the article "Candelabre," the illustrations to which include an engraving of that splendid foot of a candelabrum from Rheims which is at present in the Trocadéro Exhibition.

The Encyclopédie, when complete, will be a mine of information and illustration in regard to subjects connected with architecture; but there is, as is so often the case in dictionaries of this kind, a certain want of proportion in regard to the degree of elucidation and illustration bestowed on the different subjects; and, for a general Dictionary of architecture, it is not sufficiently cosmopolitan. This is a defect which unfortunately we must expect to find in any French publication of the kind. For a nation of very clever and gifted people, perhaps the most gifted of any at present, the French have a remarkable faculty for not going out of themselves; and the proportion of space given to French buildings and French architects, and the comparative neglect of other countries, in this work, is an instance of this. Short biographical sketches are given of various French architects beginning with B. and C., under their respective names, but the name of Burges, who certainly was a more important power in modern architecture than, for example, Calliat, does not appear at all. Of course if this were a French architectural Dictionary professedly, like Viollet-le-Duc's, this would be all right; but it professes to be a general work of reference. Four pages of writing, seven large plates, a reproduction of a view by Du Cerceau, and two plans, are devoted by M. Planat to the château of Blois; and of course Blois is a monument of exceptional interest. But if special buildings are to be included, we might have expected to find the palaces called "Barberini" and "Blenheim" and "Borghese" at least claiming a few lines; and we might have thought that so remarkable a building as Villa Caprarola would not have been passed over in silence. But then these buildings are not in France. In the biographical portion the name of Basevi certainly had a claim to a few words; and though we find (recurring to the first volume) that half a column is given to a short notice of Robert Adam, an honour which he probably owed to the fact that his book on Spalato was got up in conjunction with the French architect Clérisseau, there does not seem to be the slightest idea on the part of the writer of the important influence which Adam exercised on the form taken by Classical architecture in England in his own time, and now again in the present revival: any more than he suspects, we presume, the influence exercised on modern English Gothic by Burges, whom he quietly consigns to oblivion. If M. Planat wishes his book to be a real encyclopædia in the true sense of the word, he should endeavour to forget that he is a Frenchman, and look at buildings and architects from a more central point of view.

The Strike of Bricklayers in Dublin still continues, the men refusing to listen to propositions for arbitration. The *Freeman's Journal* states that since the beginning of the strike 280 Dublin bricklayers have been sent, at the expense of their society, to Belfast, Glasgow, and to the principal towns of England. Unfortunately, the bricklayers' labourers are suffering through the strike.

THE BAPTISTERY OF PISTOIA, TUSCANY.

THE Italian Government intends to repair, from public funds, the famous temple of St. John, or the Baptistery of Pistoia, some parts of which had been damaged by the weather and by the winter frosts. Prof. Francesco Bartolini, inspector of monuments at Pistoia, was ordered to study the monument, and to draw up proposals for the necessary repairs, and the Government has already received a learned and elaborate report from him, together with twenty-four drawings. It is well known that the Baptistery was built by Andrea Pisano, who employed Cellino di Nese da Siena to superintend and direct the works. It is proved, writes Signor Bartolini, that a more ancient Baptistery was built on the site now occupied by the present Baptistery, for in a document in the archives of St. Jacopo, signed by the notary, Amadio Guidaloste (1256), we read of "repairing the Baptistery of St. John in Corte, dilapidated through age." We learn from the manuscript and unprinted *historia* of Pandolfo Arferoli that in January, 1303, it was resolved to demolish all that remained of the ancient Baptistery, and to erect a finer one in its stead. We cannot be sure about the year in which Andrea Pisano commenced the work, but from Signor Bartolini's studies and researches, it results that they were commenced about the year 1333. We may say that the shell of the building was finished in 1339, as we read in the municipal archives of Pistoia that the workmen of San Giovanni e Zeno came to an agreement with Mastro Cellino di Nese about the covering of the walls with Carrara marble and *marmo verde di Prato*. It may be said that the building was entirely finished in 1361, for we read in the above-mentioned manuscript of Arferoli, that a ball of gilt bronze was made in that year to be placed on the top of the cupola. We cannot expatiate here on the important work of Prof. Bartolini, or on his studies concerning the monument. It is much to be wished that he should be induced to publish this work, together with the drawings. We may, however, point out the results which have been obtained by Prof. Bartolini's researches concerning the monument and the archives of Pistoia, researches which have been followed by very important discoveries. In the first place, it has been shown that the Baptistery has undergone repairs in the course of different centuries, very often to the prejudice of its original construction, as some of the principal architectural features were altered, and important decorations, which were an essential element in the original character of the edifice, were demolished.

1. Researches in the interior of the Baptistery led to the discovery of some ancient chapels of the mediæval period, and which had been covered with marble, and are mentioned in the archives of the city. The remains, or indications of these, were discovered in the sides of the octagon. During a series of faulty repairs the chapels had been walled up with brick masonry, perhaps for fear of the whole building coming down. Prof. Bartolini's discovery, therefore, was purely accidental.

2. The position and shape of the staircase was studied, by which access was obtained to the external Gothic pulpit on the right of the principal door.

3. But the most important result of Prof. Bartolini's researches is to have ascertained that, in the original building by Andrea Pisano, the cupola did not commence immediately above the story still in existence, but that spot was occupied by another story with an arcade, with windows in the Gothic style alternated with slender twisted shafts. This higher story was ornamented, as also the lower one, with marble pinnacles. At the present moment nothing remains of the second story and of the arcade but some traces of foundations and two pinnacles corresponding to that part of

the church above the façade. Prof. Bartolini has drawn a plan of the edifice as it was originally built by Andrea Pisano, drawing the whole from the remains which he found in the course of his researches. This scheme, however, will not be carried out. The opinion of the Professor was fully confirmed by two ancient drawings of the Baptistery, discovered in the municipal archives, one of which bore the date of 1603, the other 1753, in which the base of the cupola is represented as being adorned with two stories with balustrades and shafts in the Gothic style, instead of one story, as we now see it, and as it was generally believed to have been since the erection of the building.

Prof. Bartolini has also presented to the Government a scheme for repairing the belfry of the cathedral of Pistoia, a simple mediæval tower, converted into a steeple in the year 1300 by Giovanni di Nicola Pisano. The higher part of the building is very much damaged, especially the top, upheld by four stout pillars, which is, indeed, in danger of collapsing. The tower is sixty metres high, and is ornamented with large Gothic windows, alternated by slender pillars. These windows were walled-up in the middle in the last century, when the building was repaired with barbarous taste. At the foot of the tower are sculptured many coats of arms, belonging to the consuls and podestás of the ancient town of Pistoia. L. B.

NOTES.

WE heard informally the other day that the Metropolitan Drinking Fountains Association had come in for a tolerably handsome bequest, to be expended in the work which they have been long carrying on. It is to be wished that the Association would make this an occasion for reconsidering their action with regard to the designs of the useful and durable but exceedingly ugly fountains which they erect in the streets of London. The Association rejoices, we believe, in the services of an honorary architect, who furnishes what he and they may be pleased to call "designs," but what we should call rather "patterns" for fountains, which have gradually collected into a kind of "pattern-book" from which those who wish for the assistance of the Association in erecting a fountain can make their choice. Were the "patterns" beautiful in themselves, still even then this would be a bad system, inasmuch as each site has its own character; besides which, the repetition of stock designs is a poor and inartistic proceeding, in a case where each fountain has to be separately worked, and where there is therefore nothing to be saved in the working by repeating the same design in several places. The fountains set up by the Association are in general the most absolutely commonplace things that can be imagined; they do their work, but they are no ornament to the places in which they are set up, and are in many cases positively and offensively ugly. To impart some variety to them and to treat them with at least good taste and a little originality, would probably not cost a shilling more in the working of them, but it costs a little in brainwork first; and if the Association have any spare funds, they had better consider whether it would not be worth while, and whether it would not be a more proper fulfilment of their mission, to strive after a little beauty as well as usefulness in their fountains, and to go to a man who is an artist for a sketch for each new one, instead of repeating stock patterns evolved by a gratuitous official architect who seems at all events to estimate rightly the value of his own productions. We know there is a minority on the Committee of the Association who wish this, but they are a very small minority, and those who care for the beautifying of London should endeavour to strengthen the hands of those more enlightened members of the Drinking Fountains Association.

THE specimen number of Schreiber's "Hellenistischen Relief Bilder," to the intended publication of which we some time ago drew attention, has just appeared. The plates are certainly masterpieces of vivid and exact illustration. New photographs have been in every case taken, and with a special precaution too often neglected, where the natural lighting of the monument was defective, reflected light has been brought to bear, and that under Dr. Schreiber's own immediate supervision, so that details, all-important to the archæologist, but likely to escape the ordinary photographer, have been carefully thrown up. Where the marble was discoloured, and would in photographic reproduction produce a false effect, some process of retouching has been adopted, the particulars of which Dr. Schreiber does not divulge. The result is that the plates are by far the finest things in the way of archæological illustration we have yet seen. To each plate an addition is made, the importance of which to the specialist it would be hard to over-estimate. On thin, transparent paper a second reproduction is given in outline, with shaded portions, showing precisely what is original marble and what is modern restoration. In the series of reliefs treated of in this, Dr. Schreiber's, work, this is of the first importance; large numbers of the reliefs come from Roman museums and Roman palaces where the work of restoration has been ruthlessly carried on; plates and woodcuts give the restored version, with no hint of what is antique and what is modern, and the archæologist has too often dealt with them as though the whole were genuine material. A glance at the well-known Œnone relief of the Palazzo Spada will show this. The specimen plates are chiefly taken from this palace, which is very rich in Hellenistic reliefs. No text has as yet appeared.

L'ARCHITECTURE for the 17th of this month gives a largely illustrated article by M. Hénard on the "Galerie des Machines" at the Paris Exhibition, under the heading of "Emploi décoratif du fer." Speaking of the architectural value of various sections of iron as employed in a design, M. Hénard observes:—

"Le fer à simple T donne une ligne saillante, ferme et fine tout à la fois, bordée sur ses deux côtés de points constitués par les têtes de rivets. La cornière donne un effet analogue, mais dissymétrique.

Le fer à U est précieux en ce sens qu'il donne deux lignes parallèles pouvant enfermer soit une ligne de rivets, soit une tête de boulon plus importante à certains points de croisement.

Le fer à double T, isolé, peut donner, selon son profil, des aspects massifs ou légers, puisque l'enveloppe de ce profil a la même perspective qu'un prisme rectangulaire dont il comporte toutes les proportions.

Enfin le rivet et le boulon donnent des points d'importance variable, qu'il est très facile d'accuser avec des rondelles plus ou moins ornées ou découpées là où on juge nécessaire de les faire ressortir.

Tels sont les éléments que l'architecte doit accepter franchement et mettre en œuvre pour réaliser sa conception, sans les masquer par une ornementation étrangère, et surtout sans les forcer à rendre l'aspect traditionnel des motifs de pierre, tels que pilastres, corniches, &c., ce qui serait un non-sens."

THE Leek Improvement Commissioners seem to have acted rather illogically in regard to a recent competition for extensions to their cemetery. They advertised for plans from architects for laying-out the new portion, and awarded a premium for the best design, and appear now to have resolved in committee, in the first place to deprive the cemetery of an avenue of trees which formed part of the design, and of some other embellishments, on the ground of economy, and in the second place to have it laid out by their own surveyor, merely paying the architects the premiums. The architects whose design was selected, Messrs. W. Sugden & Son, go a little too far in saying, in a letter to a local paper which has been forwarded to us, that this proceeding was "in effect a breach of faith with them," because the stipulation was made in the conditions of competition that the Commissioners did not bind themselves to employ the successful competitor to superintend the work, and therefore the Commissioners are within their rights; but it is generally expected by a competitor in such a case that he would be allowed to carry out his own design, and if anything in the way of pleasing effect is to be made of the grounds it is not likely to be best done by putting it into the hands of a surveyor not accustomed, probably, to consider questions of effect. Indeed, it is rather difficult to understand why the Commissioners had a competition at all, as they appear to have abandoned the best points in the design as well as the superintendence of the architects who drew it out. One or two of the Commissioners seem to have expressed themselves against this course at the last meeting, but the economical majority carried the day. One of them said "he did not believe in land which cost 500*l.* an acre being laid out as pleasure-grounds." That is a very "Philistine" view to take of the matter. In all civilised countries there has been the feeling that it is fit and right that a cemetery should be made a place of some beauty, as far as possible, and not a mere space for as many graves as can be dug on it. Perhaps the Leek Commissioners have got rid of "sentiment," but it may be doubted whether they are doing the best for the town, or for themselves, in spoiling a design for which they have paid a premium, and neglecting an opportunity of making a garden instead of a utilitarian enclosure.

WE have before us the substance of a paper read to the Liverpool Engineering Society, by Mr. T. Mellard Reade, Assoc. M. Inst. C.E., &c., on the advantage to civil engineers of studying geology. The author points out the apparent indifference with which the majority of civil engineers regard the science, which apathy has in many instances led to failure of their work, more especially in respect of water-supply, reservoirs, canals, railway-cuttings, sub-aqueous tunnels, and foundations. To emphasise his remarks he gives many cases in point that have come within his own experience, and which are eminently instructive. We cordially endorse all the author says: the most elementary truths of the science, which could be learnt by any person of average intelligence in a few weeks, would quite suffice to teach the engineer either the futility of designing work in certain situations, or the necessity of calling in the assistance of a properly qualified practical geologist at the commencement. Under the present *régime* this latter course is generally adopted after the mischief is done.

A SERIES of experiments have been made in Germany by Herr Böhme with ten samples of cement in order to ascertain, firstly, their general properties; secondly, their tensile and compression strength; thirdly, their power of resisting wear on the surface. Tests were made of briquettes of pure cement, and of others consisting of one part by weight of cement to one, two, three, and four parts by weight of sand. They were alternately exposed to moist air, dried in air, plunged into water, air-dried again, and frozen at varying temperatures. They were afterwards placed in water at 64° Fahr., frozen again, thawed once more, and then left under water for the rest of their period of hardening. The chief effect of exposure to frost was to retard the setting of the cement, causing it to remain soft, and reducing its tensile strength and resistance to compression. This retardation, however, had little permanent effect, the cement becoming nearly equal to the unfrozen specimens after the lapse of a few days.

OUR French contemporary, the *Semaine des Constructeurs*, is translating and reprinting in full the articles on concrete by Mr. F. Cawa, recently published in the *Builder*.

THOSE who are interested in the history of dynamo machinery should on no account fail to see the very remarkable

plating-machine exhibited by the Corporation of Birmingham at the Birmingham Electrical and Industrial Exhibition. This machine is dated February 22, 1844, and was devised by Woolrich. It is a pity that copies of the original patent specifications are not also exhibited, as it would then be seen how much that has since been patented over and over again was known and invented by the early electrical engineers. We cannot give any detailed description of the machine here, but, on account of it, Birmingham claims to be the birthplace of the first dynamo-electric-machine ever used for commercial purposes.

WHILE we hear a good deal about the widening of the Strand, the unfortunate pedestrian bears in silence the troubles of the narrow pavement of Chancery-lane. But, in truth, no improvement is more urgently needed than the widening of that part of the footway which extends from the top of Chancery-lane wellnigh to Carey-street. Passing walkers jostle each other into the mud, and they are covered with splashes from passing vehicles. This widening would be easy work. At present there is a piece of waste ground between the railings and the buildings,—the property of Lincoln's-inn. The footway should extend from the roadway to the adjoining wall, and if this change were made foot-passengers would have nearly twice as much space as is now the case.

OWING to a subsidence of the foundations, it has been decided to entirely pull down the "condemned" Tottenham Court Chapel, or Whitefield's Tabernacle, which has been closed since June 16 last. Besides a new chapel, in the form of an amphitheatre, it is proposed, if the subscriptions reach to the estimated cost of 20,000*l.*, to erect new schools, together with a "Toplady Hall," and to set up within the latter certain memorial tablets, including that of Augustus Montague Toplady who wrote "Rock of Ages," in the present chapel. This chapel assumed its existing ungainly shape in 1860. We gave a brief account of the site and adjacent burial-ground in our columns of July 28 of last year. A story goes that in 1756 David Garrick, having learnt from his own stage-carpenter that the building was in danger of being suspended through want of ready funds, gave to George Whitefield 500*l.*; a big sum at that day, and certainly a large amount from Garrick. As we showed, the chapel, and, indeed, all its surroundings, are greatly changed from what they were on that memorable day when, close by its doors, George Warrington met Theo and Hetty Lambert as they were taking an airing in a coach to Hampstead.* An appeal for funds, issued by the minister, the Rev. J. Jackson Wray, is illustrated with views of the fabric as it appeared at various stages of its history. In the cut of earliest date is seen, in the foreground, a piece of water which we take to be the "Little Sea," as it was called. The original chapel (1756) stands, about 70 ft. square on plan, with a pedimented front, and a high roof bearing a four-sided belfry. Within a few years an octagonal fore-chapel was added on to the eastern front; this was afterwards squared, and subsequently converted as we now see it. The remains of Whitefield's wife, of Toplady, and of John Bacon, R.A., sculptor, lie in the vaults beneath the organ. The rostrum of Whitefield's mahogany pulpit, which in his day stood on a pedestal, is preserved in the upper school-room (site of the former parsonage-house); his chair is kept in the vestry.

WE hear that the governing body of the London Homœopathic Hospital propose to build new premises, at an estimated cost of 30,000*l.*, in place of their present hospital and medical school in Great Ormond-street, a building to which a certain degree of historical interest attaches. The eastern wing of the house at the corner of Powis-place (site of the first Powis House), was the residence of Zachary Macaulay. His son was living there when he wrote some of his earliest literary essays in the *Edinburgh Review*. In the "Life and Letters" it is referred to,—but wrongly so,—as the reputed home of Lord Chancellor Thurlow when he was robbed of the Great Seal (1784), the thieves making away with their booty across the then fields to St. Pancras. In his diary for August, 1857, Lord Macaulay writes:—

"I sent the carriage home, and walked to the Museum. Passing through Great Ormond-street I saw a bill upon No. 50. I knocked, was let in, and went over the house with a strange mixture of feelings. It is more than twenty-six years since I was in it. The dining-room, and the adjoining room in which I once slept, are scarcely changed. The same colouring on the wall, but more dingy. My father's study much the same, the drawing-rooms, too, except the papering. My bedroom just what it was. My mother's bedroom—I had never been in since her death. I went away sad."

Within a few weeks of Lord Macaulay's visit the authorities of the Homœopathic Hospital, who were at that time established in Golden-square, acquired the freehold of Nos. 50—2 in Great Ormond-street. The new hospital was publicly opened on May 12, 1859; in his address, Robert, Lord Ebury, mentioned that No. 50 had been, as the second Powis House, the home for twenty years of Philip, Lord Chancellor Hardwicke. Nearly all the postal numbers in that street have been changed of late, and no number is given to the hospital. When the Macaulays lived there, Lord Thurlow's house was numbered 45: it is now the Working Men's College.

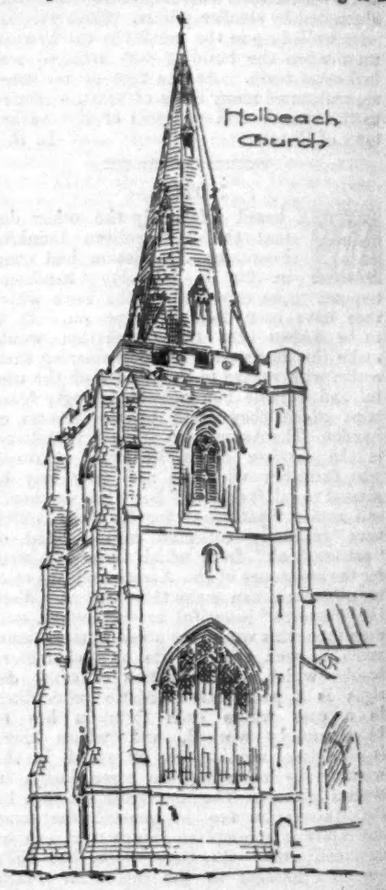
WE have received from the patentee, Mr. J. H. Jones of Manchester, a sample of the "Stocks Sash-cord Holder," which appears an exceedingly useful device for allowing of the alteration of sash cords, or the attachment of new cords to windows, without cutting up the pulley stiles or taking out the beadings and sashes. The cord is fixed into a brass holder let into the sash, and covered ordinarily with a turn-lid like a keyhole cover; this can be turned back and the holder taken out, the cord wound into it, and the holder replaced in its pocket. The pulley-stile is also made with a separate piece screwed down, leaving an opening large enough, when it is taken off, to get at the weights and attach the cord; it is proposed to make a short length of the parting-slip as a fixture on the cover of this pulley stile piece, so that this portion of the parting-slip takes off with the cover and is fixed in its place again with it. As the patentee says, when parting-slips are removed for alterations in the hanging they are frequently broken or replaced in a wrong position; and this is here provided against. The invention appears an exceedingly useful and practical one.

THE ARCHITECTURAL ASSOCIATION'S ANNUAL EXCURSION.

WE now continue our account of this excursion, commenced last week.*

Wednesday.

The third day of the excursion (Aug. 14), for which a long outing and much interesting work had been planned, was unfortunately marred by heavy rain, which considerably depressed the enthusiasm of the most ardent, and, in the opinion of some of the oldest *habitués* of the excursion, made the day, in point of weather, the worst ever experienced by the Association in their annual outings. The scene of the day's work was laid in Lincolnshire, the train being taken to Long Sutton, from which place the carriage excursion commenced. The Church of St. Mary, Long Sutton, is a striking example of Norman work in the nave, which remains practically perfect, the former clearstory windows being left open when the Perpendicular clearstory and aisles were added, so that the nave now has almost a cathedral effect with its massive and plain semicircular arches on the ground-story, its quasi-triforium, and its late large-windowed clearstory. The chancel is Perpendicular, and is remarkable for the width of the side arches, emphasised as it is by the narrow Norman openings of the nave, and giving a peculiarly open effect with the very wide aisles. There are some remarkably good specimens of old glass, most of fifteenth-century date, especially one representing St. George, in a window of the south aisle. The south porch with parvise is interesting, with its rib-and-panel vaulting in the stage of transition to fan-vaulting, and without caps to the shafts. There is also a good Decorated doorway. The Early English tower, with its ancient lead-covered spire and angle pinnacles, and its double tracery plane in the belfry, naturally attracted much attention. This is apparently one of the examples of a detached tower open on the ground-floor, the lower arches having been filled in at a later date. Half-an-hour's drive brought the party to Gedney, the large Church of St. Mary Magdalen at which is supposed to have been founded by the Abbots of Croyland, who had large possessions in the parish. Throughout the day's excursion the visitors were constantly reminded of the influence of these famous ecclesiastics in this particular district. The existing church appears to have been built during the period of transition from Decorated to Perpendicular, the aisle windows being of a



Decorated type, those of the clearstory of a Perpendicular, while the nave arcade is distinctly transitional. There is a good fifteenth century roof to the nave, a fine south porch with parvise, and some interesting fragments of old glass and of the old screens. The chancel has been restored, and the nave and aisles are in need of some slight amount of careful reparation, though restoration, as ordinarily understood, would doubtless reduce the interesting character which the visitors valued so highly. The steeple has an Early English tower with Decorated belfry-stage, and the stump of what might have been a fine spire. During the half-hour's stay at Gedney the rain fairly set in, and the remainder of the day was spoilt by the continued downpour. Holbeach was reached at mid-day, when attention was chiefly devoted to the interior, where again the period of transition seen at Gedney is exemplified in the very fine church of All Saints, the aisle windows being curvilinear in treatment, with a Perpendicular feeling in the nave arcade and clearstory. The old screen has gone, though the stair to the rood-loft remains. There are some sepulchral remains worth study, a Mediæval stone coffin-lid with floriated cross,

* "The Virginians," c. lxxvii.

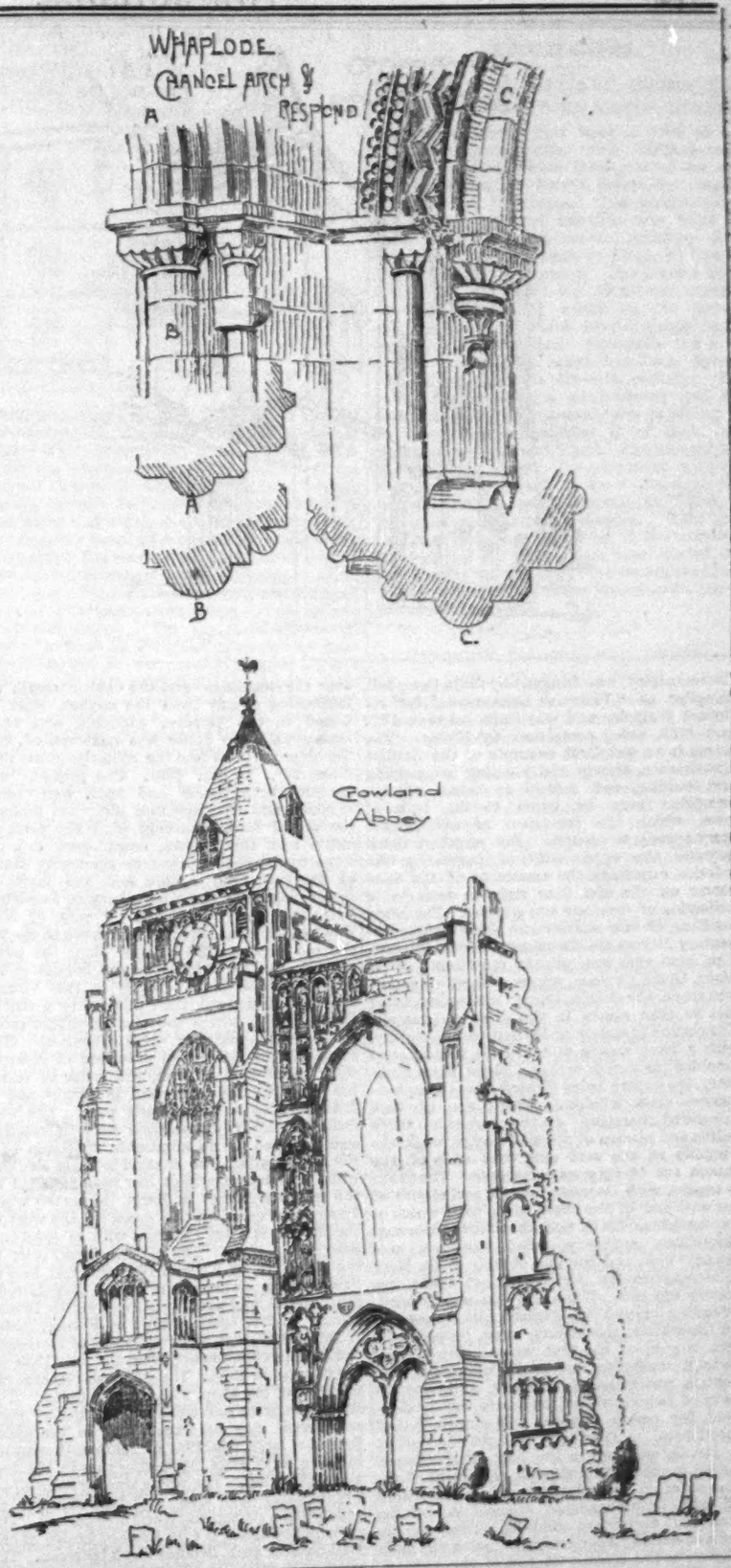
* See p. 117, *ante*.

brasses, and a very excellent fourteenth-century tomb, with life-size recumbent effigy of Sir Humphrey Littlebury. There is also a plain arched recess in the wall of north-aisle for a founder's tomb.

Externally, the fine spire, with its lucarnes and late broaches, and the great tower, are of great interest, as are also the porches, north and south, the former of which has the stairs to the parvise chamber enclosed in two angle-turrets, circular in form, making a striking feature in the design. Leaving Holbeach, the party proceeded to Whaplode, where the continued downpour again confined almost all within the church. This has an extremely interesting nave of seven bays, the four eastern ones Norman, the three western Early English, with semi-circular arches following the lines of the earlier. The stairs to the rood-loft have been added in the Decorated period, and cut into the Norman piers of the nave arcade and chancel arch. There is a good fifteenth century hammer-beam roof to the nave, with excellent detail, and in fair preservation. At the west end of the south aisle is a sumptuous Jacobean monument to "Sir Anthonie Irby, Knight, and Alice, his wife," with recumbent effigies under a canopy supported on ten Corinthian columns, and surrounded by a wrought iron railing. On the wall close by hang Sir Anthonie's helm and surcoat. As in so many other churches in the district, there are here some fine examples of Mediæval stone coffin lids, with floriated crosses. The old seventeenth-century pulpit and sounding-board have been re-used in forming a screen for the vestry. The tower stands in a peculiar position at the east end of the south aisle, with its north side only attached to the aisle wall. It appears to have been completed as a three-storied tower in early English times, and to have had a later belfry added. It was now decided, in consequence of the weather, to abandon the proposed visit to Croyland and Thorney, and to return to Lynn by the train from Spalding, calling at Moulton on the way. The Church of All Saints here had been visited by some of the members with the late Mr. Edmund Sharpe, on the Lincoln excursion, eighteen years before, under similar damping influences, hence the Transitional nave was recognised as an old friend, as was also the remarkable tower arch of Early Perpendicular date, with its very prominent diminution of openings, there being a difference of no less than 17 in. in the width between the piers at base and cap. The fifteenth-century chancel-screen is interesting, having good tracery and peculiar flying buttresses to the main mullions. The chancel-arch above attracted many sketch-books from its simple and effective treatment, the moulding dying on to the wall without cap or corbel. The triple sedilia and piscina and credence in south aisle are worthy of notice. The last visit of the day was made to the Church of St. Mary and St. Nicholas, Spalding, completing a series of six churches, any one of which would suffice in fine weather for a day's study. Spalding being originally on the boundary-line of the estate of Croyland Abbey, a subordinate cell for a prior and five monks was founded there in 1051 by Thorold de Buckenhale. At the Conquest, Ivo Talbois, Earl of Angiers, and nephew of the Conqueror, built a castle at Spalding, with the result that the monks of Croyland, finding the neighbourhood less pleasant, retired from their cell, and it was accordingly, in 1074, given with the Church of St. Mary and the manor to the Abbey of St. Nicholas, Angiers, who sent over a party of Benedictines, under whom the establishment became an alien priory to the Abbey at Angiers, and the church was dedicated to St. Mary and St. Nicholas. At the suppression of alien priories Spalding escaped the general fate, and was raised to the dignity of an abbey, which it continued to be till the general suppression of the monastic system. A church was erected here instead of the conventual church in 1284, and this was partly pulled down in 1446, and considerable additions made, including the beautiful north porch. The church as it exists is probably the largest of those visited during the day, and worthy of more attention than time allowed.

Thursday.

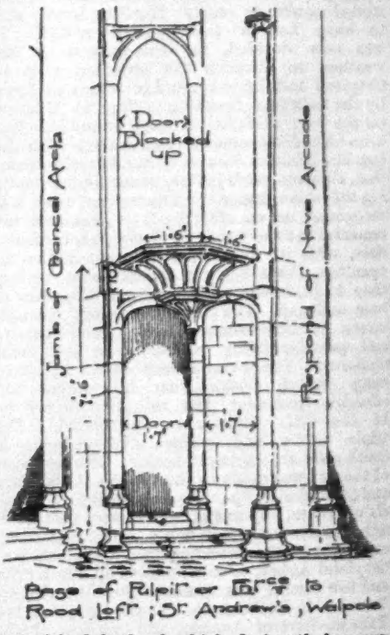
On Thursday, the 15th, a district north-east of Lynn was worked, the first halt being made for the study of Domestic work at Hillington Hall, the residence of Sir Wm. Ffolkes, Bart. This, however, proving an example of Strawberry Hill Gothic, met with little appreciation from the bulk of the members, although the work is good of its kind, in spite of the large use of Roman cement for external dressings, while the plan is certainly admirable. Half-an-hour's ride brings us to Harpley, with its Church of St. Laurence, which quickly compensated for the earlier disappointment. The nave and aisles are of excellent Perpendicular work, with a square tower at the west end, the chancel is earlier, with triple sedilia and double piscina. There are also in the south aisle triple stepped sedilia and double piscina of Late Decorated character and excellent detail. The fifteenth-century chancel screen has been restored with its coloured decoration, and there are also a fine south door and porch, fragments of old glass, some with the insignia of the patron saint, and some excellent bench-ends and fragments of seat-backs, which have been re-used in the restoration. Altogether the church was voted eminently sketchable, many bits of detail, such as the priest's door, nave, parapets, &c., being transferred to the members' books, so that the time allowed was thought all too short, and considerable reluctance shown to make a start for Houghton Hall, which was the next objective point. This, the seat of the Marquess of



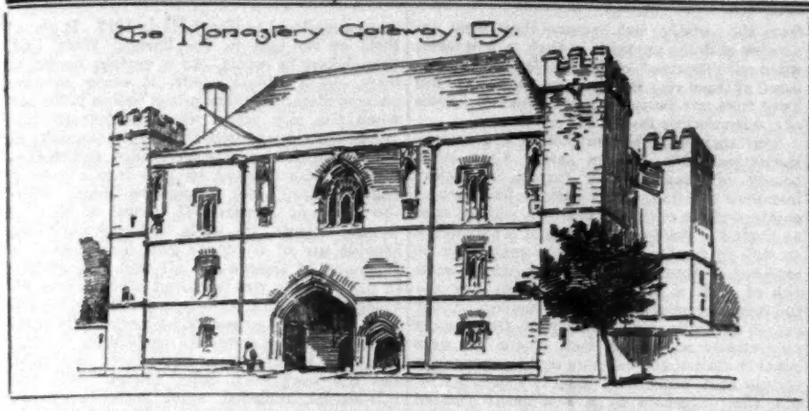
Cholmondeley, was designed by Colin Campbell, compiler of "Vitruvius Britannicus," for Sir Robert Walpole, and was built between 1722 and 1735, being completed by Ripley. The house is an excellent example of the English Renaissance, stately and pleasing in grouping and outline, and refined in detail, though exception may be taken to the lack of base, which the treatment of the ground story appears to produce. The members much enjoyed the opportunity of inspecting the interior, especially the treatment of the state rooms on the first floor and the remarkable collection of furniture and pictures. The brick vaulting of the stables and their eighteenth-century fittings are also of considerable interest. The next visit was paid to the Church of St. Mary, Great Bircham, where a short stay only was made, the church, though interesting, being less so than others in the day's programme. The church is mainly of the fourteenth century, with a nave arcade of four bays, having good moulded piers and arches. There is no clear-story, the church being lighted from the square-headed aisle windows, which are of Late Decorated character. In the chancel are triple sedilia and piscina of pleasing design, while the windows at the east and west ends of the church are of Perpendicular date. The tower is square, with Decorated detail, and stands at the west end of the south aisle, with which it communicates by a twelfth-century doorway. Snettisham, anciently called Snetham, was the next halt, and the fine church of St. Mary (illustrated in the *Builder* of last week) was greatly enjoyed. When the chancel existed, extending beyond the central tower shown in our illustration, this church must, indeed, have been a gem of the first water. The curious narthex, reminding one of Peterborough west front, is particularly interesting, while for the study of Decorated work at its fullest development, few parish churches will surpass that of Snettisham. A short ride brought the visitors to Dersingham, where the half hour allowed proved insufficient for the full enjoyment of the Church of St. Nicholas, a large Perpendicular building, with Decorated chancel containing some good curvilinear windows, a triple sedilia, and a so-called "leper's window" below the main window at the south-west end of the chancel. A good chancel screen of fifteenth-century date has been restored, as to the tracery of its upper portion, while the original figure paintings still remain below, though much mutilated. There is a somewhat interesting tomb in the south aisle to one John Pell, who died 1607, and a truly magnificent fifteenth-century chest, carved with elaborate panelling and emblems of the four evangelists. The treatment of the octagonal nave piers, with hollowed faces, finished with tracery, is notable. The next visit was made to Sandringham, the home of his Royal Highness the Prince of Wales, where the members were met by Mr. Beck, the son of the Prince's agent, who kindly showed them over the demesne,—first the church, small, but interesting chiefly from the modern work inserted in the reredos, windows, and other memorials. The house was next visited, both the older portions and the recently-added ball-room, &c., by Mr. Edis. The grounds and gardens, both flower and fruit, were much admired, and an inspection was then made of the model farm-buildings, with the pedigree cattle and the stables, coachhouse, &c., not forgetting in the harness-room the racing saddle of the late Fred Archer and the hoofs of famous horses of the past. Leaving Sandringham, the party proceeded by way of West Newton, where a short halt was made to inspect the old church and village club, the latter erected by the Prince for the benefit of his labourers, who mostly reside in this village. The day's work was then finished by a visit to Castle Rising, where the church, village cross, castle, and almshouse were examined. The church is an interesting specimen of Norman work in nave and tower, the latter of which has recently been increased in height, and is finished with a saddle-back roof. The west front is richly ornamented with interlacing arcading, and is an admirable specimen of a Norman façade. The chancel is Early English, while the south transept has been restored by the late Mr. Street in Early Decorated work. The village cross, on the green to the west of the church, is a fine example, with an octagonal base of five steps. The castle, erected prior to the year 1176, by William D'Albini, first Earl of Sussex, occupies the site of one of King Alfred's great castles, and possibly of a still earlier British camp. In this castle, Isabel of France, Queen of Edward II., was, after the death of Mortimer, detained in confinement from the year 1330 till her decease in 1358. The principal remains are the shell of the keep, with Norman detail. The site of the great hall and some vestiges of state apartments may be traced, and on the upper floor is a later insertion of fourteenth-century vaulting, with some interesting tiles in the fire-place adjoining. The whole was surrounded by a remarkably deep moat and bold rampart, on which was a strong wall with three turrets. The principal entrance is over a ruined bridge of one semi-circular arch, defended by a barbican. The almshouse, with its thirteen apartments, hall, kitchen, and chapel, was built in 1613 by Henry Howard, Earl of Northampton, and is still occupied by twelve "sisters," one of whom is at present in her 100th year, longevity being the rule among the inmates.

Friday.

Considerable modifications were made in the programme of the day, the opinion having been strongly expressed that it is not worth while spending less than an hour at one place. The alterations made, the remarkably fine weather, and the interesting character of the work visited, rendered this day the *bonne bouche* of the excursion. The first visit was paid to the Church of Terrington St. Clement, a magnificent fifteenth-century cruciform church, which has replaced earlier Norman and Early English work, fragments of which remain, as well as of some presumably pre-Norman church, for the parish was of considerable importance in Saxon times, and large salt-works existed there, as appears from a grant of Godric, brother to Ednoth, Abbot of Ramsey, about 970 A.D. The massive tower, at the north-west corner, though detached, is sufficiently near to give an admirable breadth to the west front,—a fine composition. On the north clearstory and the buttresses of the north aisle are indications of flying buttresses, and in the lantern over the crossing are corbels, which may possibly have been prepared for fan-vaulting. The font has a remarkable Jacobean cover, with shutters, and is decorated both externally and internally with colour. Three altar-stones have been found in the church,—one under the altar, one near the organ, in the north transept, and one under the south transept arch. Amongst other fragments found are two clunch images of angels with scrolls, from the nave clearstory, each of which was built into a little niche in the spandrels of the south nave arcade, in such a manner that the painted and gilded parts were in a little cavity, and so uninjured by mortar. There are also life-size figures of St. Clement and St. Christopher. In the vestry are indications of frescoes and colour decoration, now faded, and a fine mediæval painting of Byzantinesque character, representing the Virgin and Child, and given by Dr. Seccombe, the church-warden. The inscription on the fourth bell is interesting, "+ Nunc Clemens ego clamo vobis ore jucundo 1595," with a medallion. The churches of St. Andrew and of St. Peter, Walpole, were



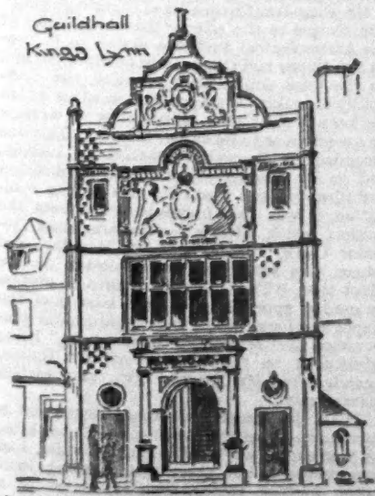
next visited, both of which derive their name from the great sea-wall erected by the Romans. Walpole St. Andrew is an interesting fifteenth-century church, with square western tower, against the outer west wall of which is what was probably an anchorite's cell. This has been rebuilt in brick, though part of the original jamb still remains. The clearstory is much over-windowed, both for soundness of construction and, with the present lack of stained glass, for æsthetic effect. There are some interesting fifteenth-century benches, a Jacobean pulpit, a piscina in the south aisle, and another in the chancel, with a window-seat in place of sedilia. Walpole St. Peter, the next stopping-place, may well be described as the largest and finest Perpendicular church in Marshland, and is a perfect museum for the architectural student, though, like other churches of the same date, it may appear somewhat over-lighted, with its thirteen clearstory windows on each side. The treatment of the altar, with its lofty elevation above the nave level to allow of the construction of a slype beneath, is particularly well suited to the great size of the church, and is very striking in its effect. The remainder of the chancel, with stone canopied stalls for choir returned against the eastern face of the screen in wood, and canopied



triple sedilia and piscina, with vestiges of colour and sculptured decoration, makes the whole an excellent example of advanced ritual arrangement, while the very fine sanctus bell-cot, with the bell still in use, completes the scheme. The woodwork in the church is well worth study; the old roofs of nave and aisles, a fifteenth-century screen to the chancel, although cut down and with its figure-paintings mutilated, excellent Jacobean font-cover, pulpit and sounding-board, and western screen, benches, both fifteenth, sixteenth, and seventeenth centuries, and traceried north and south doors of fifteenth-century work, and an alms-box dated 1639. There is also a good seventeenth-century brass eagle lectern and a hanging candelabrum. The nave arcade is remarkable for the Decorated character of the arches and piers united with the Perpendicular caps and bases, showing that the arcade must have been rebuilt with the older material, or that possibly the old caps and bases have been reworked; the former supposition appears, however, to us to be the more probable. The two and a-half hours spent here was all too short, and a start was then made for Tilney All Saints, a Transitional church, remarkable as having no chancel arch, the choir being divided from the nave only by the wooden screen, dated 1618. This has, however, probably replaced an earlier one, as the choir-seats, of fifteenth-century work, are returned against its eastern face, and the side-arches of the choir are filled with screens of the earlier date, similar ones dividing the aisles. The choir-seats have some excellent carving on their misereres. There is a good hammer-beam roof placed on the fifteenth-century clearstory which surmounts the twelfth-century work. The westernmost bay is Early English, and the tower and spire of Decorated character, with triple lancets on the second stage at the west and couplets at the sides, showing a reminiscence of an earlier arrangement. The connexion of the tower with the spire, which is of plain design, is unhappy from some points of view, in consequence of the irregular position of the angle pinnacles.

Saturday.

This, the last day, was, as usual, partly devoted to the inspection of the buildings at the centre of the district. The first visit was made to the



Guildhall, where the Mayor met the party, who were shown the interesting collection of Corporation insignia and plate, the great sword of state, whose age, in spite of tradition and its own inscription, is not earlier than the time of Henry VIII., though the blade may be older, while the ornaments on the sheath are of the time of Charles II.; the maces, made in 1711-12 by the famous Benjamin Pyne; the chains of the Mayor and waits, of about 1550, and bearing the dragon's head and cross, symbolical of St. Margaret; the so-called "King John's cup," a beautiful specimen of fourteenth-century work; and a large "hanap" of Nuremburg manufacture. Several silver tankards and cups, and old records were also shown. The next visit was to the fine Church of St. Margaret, illustrations from which appear in our issue of August 10, and which, with its massive twin towers, has a magnificent breadth of west front, while the spire, which formerly rose to some 250 ft., must have been a veritable land-mark in the days of Lynn's prosperity. Here also were inspected with great interest the magnificent and well-known Flemish brasses of Adam de Walsokne and Robert Braunche. Leaving this, the members proceeded past the ruin of the Church of the Grey Friars, whose octagonal tower, supported by arches springing from four great piers, alone remains, to the Chapel of Our Lady on the Mount, or, as it is more usually now called, the Red Mount Chapel, one of the halting-places for pilgrims on their way to the shrine of Our Lady of Walsingham. This has a small cruciform vaulted chamber, through which the pilgrims passed, ascending by one stair, paying reverence to the relics, and descending by another stair. The chapel was erected in the fifteenth century. The final visit in Lynn was to the Church of St. Nicholas, an immense Late Perpendicular church of eleven bays in the arcade, with seating for 1,400 persons. The detail of some of the doorways is interesting as showing that the tendency of English Gothic might have been, if not checked by the Renaissance, to the late development seen in Spain and Portugal. The south door is, doubtless, one of the finest examples of fifteenth century woodwork in existence. The tracery, too, of the west window is notable, though hardly satisfactory from the poverty of the leading lines. Leaving Lynn at midday, two thirds of the members proceeded to Ely, where, under the guidance of Mr. W. M. Fawcett, M.A., the cathedral and monastic buildings were visited, and the timber construction of the great octagon examined at close quarters, the party ascending to the interior above the groining. This completion of the programme was voted by all to be an excellent conclusion to a very enjoyable week.

Relative Strength of American Woods.—Some interesting tests of wood native to Washington Territory and wood from other sections of the United States have recently been made at the car shops of the Northern Pacific Railroad Company, with a view of determining the relative strength of the woods. The timber tested—pieces 2 in. by 4 in. by 4 ft. long—being about one-fourth as long, thick, and wide as an actual stringer as used by the railway company in its trestle bridges, was subjected to actual breaking in the centres. As there seems to be but little information on the subject, and it has generally been assumed that ordinary oak was stronger than fir, these tests are important. They show that yellow fir of Washington Territory is actually one-third stronger than Michigan oak, and more than one-half stronger than Michigan white pine. The tests as to deflection showed that the latter was less in the case of Washington timber than in that of either Michigan oak or white pine.

Illustrations.

SMOKING AND BILLIARD ROOMS, NEW WEST WING, CANFORD MANOR, DORSET.

We illustrate this week a view of the smoking-room, with billiard-room beyond, which form part of the new west wing, Canford Manor, Dorset, the country seat of Lord Wimborne. The earliest existing portion of this mansion was built by John of Gaunt, and various additions have been made in later years by Blore, Sir Charles Barry, and David Brandon. The present work, which was completed last Christmas, consists of a large suite of rooms on the ground and first floors, of which our lithograph represents the two principal. Externally the style of the rest of the house has been strictly adhered to, viz., late fifteenth century. The gables are filled with blind tracery and the parapets pierced. Internally the panelling in the two rooms illustrated is of dark oak, elaborately carved and inlaid. The greater part of the carving is old. The remainder, with the framing, was executed by the workmen on the estate, under the clerk of works, Mr. Tawse, in the most satisfactory manner. This also applies to the linen panelling in the corridor. The whole of the works have been carried out from the designs and under the superintendence of the architects, Messrs. Romaine-Walker & Tanner, of London.

COMPETITION DESIGNS FOR RICHMOND MUNICIPAL BUILDINGS.

We give this week, by permission of the Corporation of Richmond, illustrations of the first and second premiated designs in this competition,—viz., two views of the first premiated design, by Messrs. Elkington & Son; one view of the second premiated design, by Mr. T. Verity; and the ground and second floor plans of each design.

The designs were fully commented on and described in our review of the competition in the *Builder* of August 10, page 95.

THE OLD MANOR HOUSE, WANDSWORTH.

This is a view of the fine staircase in the old Manor House at Wandsworth, together with a small sketch of the house, to which public attention was drawn a little while since by the announcement that it was to be sold and pulled down. It has been dismantled, if not entirely removed, since these sketches were made.

The house is said to have been designed by Sir Christopher Wren. Some further information in regard to it will be found in a "Note" in the *Builder* for May 11 of this year, page 350.

THE ROYAL ARCHÆOLOGICAL INSTITUTE AT NORWICH.*

Thursday morning, the 8th inst., was devoted to the annual business meeting of the Institute, at which none but members were present. Mr. J. T. Micklethwaite took the chair. It transpired, however, that, after the report, accounts, and balance-sheet for the past year had been read, adopted, and approved, a discussion took place as to the selection of the place of meeting next summer. Mr. Micklethwaite stated that Cambridge had been suggested, but there was one obvious objection,—namely, that Cambridge is too near to the place of meeting in 1889. Edinburgh also was proposed, but it appears that the visit of the Institute will be more welcome and appropriate in 1891 than in 1890. The Rev. Mr. Manning and Mr. E. Walford were strongly in favour of Reading being chosen, as that town had never been visited by either Archæological Society for many a long year, and it was well within reach of Silchester, the Berkshire Downs, the battle fields of Newbury, Donington Castle, the Cromlechs at Roll-right, the earthworks of Wallingford, and Ewelme Church and Hospital. The feeling of the meeting, however, was strongly in favour of going next year into the West of England, and Cardiff, Plymouth, and Truro were each suggested. In the end, however, a resolution was passed to the effect that the choice should be left entirely in the hands of the Council.

This private meeting being over, the Rev. Dr. Jessopp opened the Historical Section with a

* See pp. 101, 119, *ante*.

scholarly and thoughtful address, in which he reviewed the rapid progress of archæology as a science since the previous Congress in Norwich in 1847. It was true that at that gathering there had been present many intellectual giants,—Dean Peacock, Dr. Whewell, Bishop Stanley, and his gifted son, Dean Stanley, Henry Hallam, and Dr. Adam Sedgwick, for example,—with whom the present members of the Institute could not for a moment compare; but, still, forty years ago there was little or no conception of the antiquity of man, and geologists started back, almost in horror, at their own discoveries, superstitiously afraid lest their science should be found to conflict with the Mosaic records. Turning to the subject of the ancient Britons, Dr. Jessopp referred to the story told by more than one classical writer of antiquity, that Pytheas visited Britain 300 years before the Christian era. There can be no doubt that Pytheas was credulous, like our own early travellers; but, said Dr. Jessopp, the question now was not what the Romans did in Britain, but what did the Romans find? The question which presses for answer may be said to be:—What was there in this Britain of ours which made it worth while for the Romans to invade it in the century before Christ, and compelled them to leave it unattacked for another 100 years, though again and again during that century they bragged of what they were going to do, which induced them to carry out their threats, and which led them afterwards to keep their hold on the island for 400 years? The wonderful discoveries announced by archæologists from all parts twenty-five years ago led us to see that men had been fighting, toiling, making tools, and advancing in the arts far, far back, perhaps to the pre-Glacial period. These discoveries then dazzled us all. Everybody went groping about for flint implements, and everybody who groped long enough found them. Now we know almost as much about the life and habits of the men of that vastly remote past as we do about the civilisation of those later inhabitants of our island, who, in comparison with the others, are but as men of yesterday. But surely we ought by this time to know about those men of yesterday. Some points regarding our British progenitors are, however, now well enough established. We know well that they traded in copper and tin for centuries. They worked the ironstone of Sussex. The first cause of quarrel between them and the Romans was because they had allied themselves with the Veneti, who fought that famous sea-fight with Cæsar the year before he first invaded them, and amazed Cæsar by letting down their anchors with chain cables. Clearly, too, those Britons had a formidable mercantile marine. Twenty years after Cæsar the carrying trade of the Channel and the export and import duties which they paid constituted an appreciable item in the Roman revenue. The southern parts of the island were studded with buildings. Agriculture was carried on on a large scale, especially to the north of the Thames. They had a currency, even a coinage. They had an extensive network of roads. Before long Britain became a corn-growing country, and the epicures of Rome appreciated highly, or pretended to, the oysters of Rutupiæ (Richborough). The sentiment of nationality was strong amongst them. Cassivelaunus ruled over a kingdom firmly consolidated with a splendidly organised army, and such a cavalry force as Rome had never encountered since the days when Hannibal's Numidian horsemen swept over the plains of Italy. Of the Druid hierarchy we know but little; but this we do know, that they were a highly educated class and the educators of the people. They had some knowledge of astronomy and geography, and an elaborate ritual. London was a great emporium long before Cæsar's landing, and it continued to be so without break in its prosperity down to the dreadful rebellion of the subject people, who had been driven to madness by the Roman tax-gatherers, money lenders, and ruffianism of all sorts. Can it be so absolutely certain, as has been assumed, that all those villas, pavements, roads, baths, and vestiges of art are strictly what we understand by Roman—that is, work of exclusively Roman hands? Can these people have been so very barbarous, and so incapable of assimilating the new civilisation of their conquerors, that when the aliens left them to defend themselves the British became the prey of their invaders, not because they were mastered by overwhelming multitudes from the outside, but because they were incapable of doing anything in their own defence, when once deprived of the guidance and command of those very Romans who themselves ran away from any further contest with the hordes of the irresistible invaders?

Next, turning to the subject of our ancient institutions, Dr. Jessopp said: "No other county of England can furnish so many instances of strange and curious tenures and customs whose origin points to a distant past as Norfolk. Further, few parts of England are so rich in family papers which remain to be explored. Among the questions which arise out of such a condition of things are the following questions:—Did the manors spring out of the village community of freedmen, a co-operative society in fact, where all were equal in station and all were equal owners of a certain area which they tilled in common? or, did they originate in a settlement planted by a chieftain with his dependents, who won the land and cultivated it for their lord? Are we to look upon the manor as an institution of Roman or of Teutonic origin? Again, with regard to jurisdiction and procedure and the authority of local courts—courts baron and courts leet, &c.—the accepted views of the great lawyers of the seventeenth century are in process of being very severely cross-examined. Only during the last few months have we been startled by an announcement made by Professor Maitland, of Cambridge, to the effect that he strongly suspects the word "leet" itself is of East Anglian origin, and the thing itself is to be found before the twelfth century in Norfolk and Suffolk exclusively.

Dr. Jessopp concluded his address by remarking that the more we know about those who have gone before us, whether as builders, or as citizens, the better we shall be able to understand and appreciate the present and to shape our course in preparing for the future.

The address was followed by a short paper from the pen of Professor Browne, of Cambridge, upon an Incised Stone with a Runic inscription, which has been recently found at Upton, near Birkenhead, in the Wirrall district of Cheshire. So far as can be deciphered, it is the record of the death of a private citizen, Œdelnoth, with a request for prayers on his behalf.

The members of the Institute and their friends next went to Norwich Castle, under the guidance of Mr. Hartshorne, F.S.A., who had promised to read within its walls a paper on its past history. The Castle, it should here be mentioned, since its disuse as a prison, has been purchased from the Government by the Mayor and Corporation of Norwich, who have laid out the slopes at the base of its keep as a public recreation-ground, and have emptied the outer shell of all those "fixings" by which its interior was fitted up for the reception of prisoners. Its four walls, therefore, are now roofless and open to the sky, and the *débris* has not yet been cleared out, so that its floor (so to call it) is about 6 ft. above the proper level. Standing on a large mound of stones in the centre of this open space, Mr. Hartshorne gave an interesting sketch of the Castle from its first inception, more than a thousand years ago, when an artificial mound was thrown up by Saxon hands, and the "Castle Fee" and "Castle Meadow" were marked out. It then became a moated structure, the "hill" of the "burgh," and was doubtless palisaded around, and utilised as a place of protection for cattle as well as a garrison. Once and again, or perhaps oftener, this "burgh" was burnt and thrown down, and it is said to have been destroyed by the Danes under Sweyn in 1004. Soon after the Conquest, King William is said to have built a castle at Norwich, but this need not mean anything more than that the Norman king strengthened the old earthworks, and set up a shell keep of masonry on the site. Over this castle he placed a constable, Ralph de Guarda, who revolted against him, when, after a siege of three months, the stronghold was retaken by the King. The same thing happened again in 1135, when Hugh Bigod, its then constable, was forced to surrender it to the new King. For political reasons, however, Hugh Bigod was reinstated by the sovereign, who created him Earl of Norfolk, and under him the present castle keep was erected about the same time with Hedingham Castle in Essex, Castle Rising in Norfolk, and Rochester Castle in Kent. In the next century Norwich Castle was held for Louis VIII. against King John, but was surrendered to Henry III. in 1217. It played little or no part in the Barons' Wars, and, though kept in repair,—to a certain extent at least,—as a Royal castle, it seems to have become already a State prison before 1230; and when the city walls were commenced, just before the close of that century, its necessity as a means of defence was superseded, and thenceforth it was allowed to pass into a state of neglect, though not of positive decay. From the reign of Edward III. down to that of Queen Victoria, its walls had been put to the ignoble use of a county gaol for felons. In the reign of George III. all that was ancient in its interior was removed, and its area divided by red brick walls into partitions for the safe keeping of prisoners, and externally parts of it had been "restored" by Wilkins in 1825. Ten years later the keep was refaced externally, but the work then done, though solid and substantial, replaced much better work, and wrought by more skilful and tasteful hands. Mr. Hartshorne then went on to describe some of the parts of which more or less traces remain,—the main entrance gateway, covered by a fore-building; the old oratory in the south-eastern angle; the kitchen, with its curious newel staircase in the north-west angle; the principal staircase; and the garderobes. The basement, he added, is said to have been vaulted; but this, he thought, was very improbable, since, if such an arrangement was made, all the stores must have been carried through the fore-building up on to the first-floor, and then have been lowered down inside. One part of the interior must have been a well; but this cannot be found, though it is said to have been situated in a partition which ran across the shell-keep in the centre from east to west. The great hall occupied the whole of the space on the north side of this cross-wall, the foundations of which are now uncovered. In conclusion, he said that Norwich Castle has now for the first time been surrendered into the hands, not of a tyrannical king or of a turbulent noble, but into those of the people; and he trusted that the citizens of Norwich would speedily utilise it as a local museum,—a purpose for which it is all the better adapted since its interior has been cleared from all *impediments*, and there is nothing to prevent any well-considered design for its rearrangement from being carried out. To fit it up, not in sham Norman work, but in a plain, simple, unpretending style (as has already been done at Taunton and at Colchester), would preserve its grave, solid, and majestic character, and maintain the venerable walls of Hugh Bigod's keep for the contemplation and guidance of future generations of historical and archæological students.

Mr. J. T. Micklethwaite, F.S.A., here remarked that he understood from persons resident in the city that there was and is no intention of erecting any sham Norman work, and that it would be better, from every point of view, to leave the walls untouched, so that they may tell their own story. It would be well, in his opinion, to throw over its interior a nineteenth-century roof of glass and iron, even at the risk of its being laughed at as a bad imitation of a railway station, and to use the ground-floor only as a museum.

Mr. Ferguson, Chancellor of Carlisle, proposed a resolution to the effect "that this meeting of the Archæological Institute desires to impress on the Mayor and Corporation of Norwich, and on the local Architectural Society, the desirability of making systematic excavations within the keep of the Castle, with a view of clearing up questions as to its earlier history." This was seconded by Precentor Venables, of Lincoln, and on Dr. Jessop explaining that provision had already been made for this by the committee, it was felt inexpedient to press the motion, which, after a few remarks from Professor Clark, the Rev. C. R. Manning, and others, was withdrawn, a resolution to the effect that, "This Congress desires to express its cordial appreciation of the labours of the Mayor and Corporation with regard to the preservation and excavation of the keep," being substituted on the proposal of Mr. Batten, seconded by Mr. Baylis, Q.C., and carried unanimously.

Mr. E. Boardman said that designs for a rearrangement of the interior, very much after the plan suggested by Mr. Micklethwaite, had been prepared, but there was a strong local feeling against them. The evidences of a former roof still remained, and this the good people of Norwich wished to have renewed, if possible. Then again, the arcade running

across the keep will be executed in terra-cotta, so that it cannot be misunderstood. The new roof will indicate the height of the side walls, and hide nothing that is of archæological interest. The gallery, carried round the level of the first-floor, would enable visitors to see the chapel and other portions of interest which would otherwise be difficult of access. This was confirmed by the Deputy-Mayor, who said that it was only after a great amount of careful discussion that certain plans for the re-arrangement of the interior had been approved. The gallery would enable visitors to examine the Castle better than they could do from the ground-floor. The plans were approved a month ago, and though it had been decided to commence operations at once, yet it was felt to be desirable to delay the work till after the visit of the Institute, that advice might be obtained as to whether it was desirable to clear away all the made soil, which was something like 8 ft. or 10 ft. higher than the level of the mound outside, or to adopt the present floor line for museum purposes. If the soil were cleared out there would be all the more difficulty in getting light. Shafts had been sunk in various parts of the interior of the keep and nothing had been found.

Upon the question of the geological structure of the mound on which the castle stood, the Deputy-Mayor exhibited some admirable geological sections and plans, which showed that though its base was a rising hillock of sand, yet much of the upper portion was clearly "made earth." Indeed, it had been shown by actual experimental boring that the mound was, at one spot at least, artificial to a depth of 33 ft. He therefore pronounced the mound to be artificial at that point, and he had no doubt whatever it was so throughout. But the mound must be of great antiquity, and it must have required an enormous time for the made soil, of which it is composed, to have become sufficiently consolidated to permit of the erection upon it of a ponderous building like the Castle.

After luncheon the party visited several of the principal buildings of the city, beginning with the curious old church of St. Gregory, where the Rev. W. Hudson displayed two specimens of pre-Reformation embroidery, an elaborate hearse-pall of black velvet, richly embroidered with dolphins and other devices, and an *ante-pendium* or altar cloth, of red velvet, most delicately embroidered also with sacred devices. These were spread out on the benches in the nave, and attracted much attention, especially from the ladies. They had also pointed out to them the curious fresco painting of St. George on the western wall of the north aisle, and the brass knocker of a door once used by those who fled to the church for sanctuary and protection.

The next place visited was the Strangers' Hall, as it is somewhat absurdly called, in St. Gregory's Parish. It is clearly an old city mansion, probably of the fourteenth century, once beautifully carved both externally and internally. The large room standing is the dining hall, as shown by the oriel window and the buttery-hatch openings in the wall under the gallery. It would appear from a short paper read in this room by Mr. M. Knights, that the room had been used as a place of meeting by the members of the ancient Guild of St. George, the Patron Saint of England, whose festival used to be kept in Norwich with special solemnity. It was probably called the Strangers' House from having been lent to the Walloons or other Huguenot refugees at a far later date. This curious specimen of domestic architecture struck many of the archæologists by its resemblance to houses of the same kind at Salisbury and in the parish of St. Mary Redcliffe at Bristol. It is needless to say that it was generally regarded as one of the most interesting objects in the city.

The next object of pilgrimage was the Guildhall, where the party were joined by their President, the Duke of Norfolk. As the regalia had been removed for exhibition at St. Andrew's Hall, the inspection was limited to the building itself, which is externally a fine and lofty specimen of flint-work arranged in diamond patterns, the cornices, window dressings, and battlements being of freestone. A few of the old Perpendicular windows remain, but most have been restored; in this Guildhall was formerly a chapel dedicated to St. Barbara, where the prisoners used to hear the service. The Mayor's Council Chamber still retains a good deal of the furniture of the time of King Henry VIII. The armorial panels in wood, the painted glass,—much of it modern,—and the ancient carved desk before which the Mayor sits on State occasions were shown, as was also the sword of the Spanish Admiral Winthuysen, who was taken prisoner at the battle of St. Vincent, and died of his wounds. The portraits of "Old Crome," the Norwich painter, and of Lord Chief Justice Coke, were also much admired. There was no time even to attempt an inspection of the civic records.

Arriving at the noble and cathedral-sized church of St. Peter's, Mancroft, the party were shown over it by the Rev. Mr. Baggallay, the Rector, but his explanatory remarks were much curtailed by the want of time. On the way near this church the Duke of Norfolk and several members of the party visited Mr. Back's beautiful mansion of sixteenth-century date, known as Curat's house.

The ramble about the streets of Norwich was brought to an end soon after four o'clock by the appearance of a long row of carriages and breaks, which had been engaged to take the visitors over to Carrow Abbey, between Norwich and the Prowse Railway-station, where Mr. J. J. Colman, M.P., and Mrs. Colman welcomed them. Precentor Venables, in the absence of Mr. St. John Hope, gave to the assembled party a brief account of the history of Carrow Abbey,—or rather Convent, for it was an abode of nuns under an abbess, and the sisterhood had in their hands the education of most of the young ladies of the upper classes in East Anglia previous to the Reformation, when the Convent was suppressed, most of its walls being thrown down and its inmates scattered. The outlines of the Convent Church are now traceable all round, thanks to the reverent care which Mr. and Mrs. Colman have bestowed upon it; the high altar, the sacristy, and what looks like a chapter-house (though that it could scarcely have been) to the north of the chancel are still to be seen *in situ*, and many of the columns have their bases perfect. Arriving at Mr. Colman's house, which was once the residence of the Lady Abbess or Prioress, the party were ushered into the Great Hall, which contains an excellent collection of books, tracts, and pamphlets on Norfolk and Norwich; and here Mr. Walter Rye was ready to read some brief notes on "The Unpublished Manuscripts available for a History of Norfolk." In the course of this paper he expressed an opinion that the parish clergy are not good custodians of the registers of their several parishes,—a statement which called up Dr. Jessopp to vindicate their character, and some lively "sparring" was just commencing, when the party were called to their carriages, which were waiting to convey them back so Norwich. It should be mentioned that before commencing his paper, Mr. Rye paid a kindly tribute to the memory of Mr. Walford Selby, of the Public Record Office, of whose death he had only just heard, and who was a very intimate friend of many members of the Congress.

In the evening a large and brilliant assembly was gathered together in St. Andrew's Hall in response to the Mayor's invitation to a *conversazione*. The hall was tastefully draped and decorated for the occasion, and there was an attractive programme of music and of singing. The Duke of Norfolk, President of the Congress, was present, together with the High Sheriff, and many officers of the Army, Navy, Militia, and Volunteer forces. The Mayors of Thetford, Yarmouth, Lynn, and Lowestoft also were present, and the corporation of the three first-named boroughs exhibited their maces, swords, plate, and all their regalia, which were arranged under glass cases on tables in the centre of the room. Mr. St. John Hope had kindly undertaken to comment upon them, and to compare and criticise them. The Norwich maces, it may be well to mention here, were the largest, and, in some senses, the best of all, and Mr. Hope dwelt especially on the crystal mace as a very grand specimen indeed, to be paralleled only, if at all, by the chief mace of the Lord Mayor of London. He also said that especial notice ought to be taken of the curious silver oar sent over from Great Yarmouth, and of the cup of King John, exhibited by the Mayor and Corporation of Lynn. This, he said, was doubtless of the date of the reign of Edward III., and might very possibly have belonged to King John of France. But whether that was the case or not, it must certainly be pronounced a magnificent specimen of English workmanship, and one which showed that this country could produce as rich and good work in metal as the Flemish craftsmen or the artificers of France.

On Friday morning, the 9th, immediately after breakfast, the party, a hundred strong, went off by railway to Great Yarmouth, where an inspection of its noble Parish Church, its curious Toll-house, and its even still more curious "Rows" formed a part of the programme of proceedings. Here they were met by the Mayor, Mr. F. Danby Palmer, who conducted them all through their visit to the town. On reaching their destination, the party walked along the Market-place to the southern entrance of the church of St. Nicholas, to whom, as the patron saint of fishermen, the fabric was dedicated by its founder, Herbert de Losinga, Bishop of Norwich, in 1123, and greatly enlarged within forty years afterwards. It consists of a nave and three side aisles (the latter wider than the original nave), and each somewhat differing in structural details, and making the interior very broad in comparison with its length. The armorial bosses of the panelled ceiling were the subject of comment. Its central tower is surmounted by a spire. The church, which a quarter of a century since was in a very neglected state, has been carefully restored to a very great extent,—bit by bit, and part by part,—under the superintendence of Mr. J. P. Seddon. The Purbeck marble font, the "prior's" tomb in the north aisle, with its fine crocketed canopies and floriated cross, were much and deservedly admired, as was also the curious book-rest in the library in the northern transept. The absence of fine monuments and brasses in this church is noticeable; and it was explained that the circumstance was due to the vigour with which the doctrines of the Reformation were enforced by the people of the town. Mr. Walter Rye, in his "Guide to Norfolk," writes that "the destruction of them at the time of the Reformation seems to have been shameful. All the brasses were taken up and sent to London, to be cast into weights, and all the gravestones in the church and churchyard were sent by sea to Newcastle, to be made into 'grindstones'; and it is said that the 'holy stones' with which the decks of ships were scrubbed took their name from being pieces of sepulchral monuments."

Among the other places inspected by the party were the old Toll-house, or Tol-house, once used as a prison for offenders in the town; the Public Library, kept in a house once used by the congregation of the Dutch Protestants, who settled here in the reign of Queen Elizabeth; the "Star" Inn, a fine specimen of Elizabethan domestic architecture, and full inside of good old carving in oak; the "Town Hall" and its Record-room, containing "the Yarmouth Hutch"—a Mediæval iron safe, used formerly for keeping the plate and other valuables belonging to the Corporation; the fine old Mansion-house on the south quay, formerly occupied by the late Mr. C. J. Palmer, with its elaborately-carved front room on the first floor, which once belonged to the regicide Bradshaw, and in which it is said that a council of the leaders of the Commonwealth party was held when the execution of Charles I. was finally decided on. Friar's-lane and its old flint house, once occupied by the Drury family, were also pointed out, and visits were paid to one or two of the curious narrow "Rows," for which Yarmouth is so famous, and up which no carriage can be driven, except the Yarmouth carts, specially built for that purpose. St. George's Church, of Queen Anne's reign, and the old Charity-school were left unvisited for want of time.

After lunching at the Assembly-rooms, the party were in readiness for a drive in carriages to the old Roman Camp at Burgh Castle, across the railway and the river, and, in fact, locally situated in the county of Suffolk, at the confluence of the Yar or Yare, the Bure, and the Waveney. This was, or at all events it is now generally accepted as having been, the Garianonum of the Roman period of occupation, and possibly served as the Hiberna Castra, or winter quarters of the Imperial soldiery, while Caister, on the opposite side of the estuary, served as their Æstiva, or summer quarters. The route to Burgh Castle lay through three or four miles of "green gates," as the roads across the fields hereabouts are styled. The Castrum itself, or rather three sides of it (for the western side has perished), stands in a commanding position overlooking the Breydon waters, and from its walls an extensive view is obtained over the neighbouring country. The walls include an

area of about five acres; they are about 370 ft. by 640 ft. in breadth and length, and mostly 9 ft. in thickness, with an average height of 14 ft. or 15 ft. They are built of that rough and solid Roman masonry which is so familiar to those who have visited Lincoln, or Colchester, or the old Verulamium close to St. Alban's. The solid flanking walls are interesting on account of some curious circular holes in their summits, about 2 ft. in depth and width. There have been all sorts of speculations as to the use of these apertures, but they have been thought to have been intended to hold timber watch-turrets, though many persons think that they were used for balistæ.

On these fortifications Mr. Rye observes:—"The western wall has been so thoroughly demolished that its very existence has been doubted by many, who not seeing any traces of it have jumped to the conclusion that it once had a water front, from which the river has since subsided. Mr. Harrod, however, some years ago, demonstrated its existence by digging trenches, and coming across its foundations; but whether the wall he found was equal in importance to those on the other three sides remains doubtful; and it certainly seems strange that, while three walls are in such a fine state of preservation, some parts of them being literally as perfect as on the day when they were built, the fourth wall should have so thoroughly vanished, if it had been equally substantially built."

On reaching Burgh Castle a shower compelled the party to take refuge in the church, where Dr. Raven gave his address from the pulpit steps. The following is an epitome of what he said:—

The earliest notice of Garianonum is found in the geography of Ptolemy, written in the time of Hadrian, where we read the record of the position of the Wash, the mouth of the Garienus or Yare (probably further out to the sea than Lowestoft Ness), the mouth of the Blackwater, &c. Ptolemy's calculation put the mouth of the Yare too far north for Burgh Castle, or even Yarmouth. But across the marsh, near the sea at Caister, was a Roman camp with dwellings, and till the days of the Conquest the North River ran into the sea just south of Caister. Caister was most probably the original Garianonum or Yare camp. The camp at Burgh may have been nearly coeval with Caister. But there can be no doubt that it is the place called Garianonum in the Great Survey of the Roman Empire, made A.D. 395. Dr. Raven gave an epitome of the account given by Harrod of his excavations for the west wall of the camp next to the water. The result of those excavations carried conviction that Burgh Castle, like Richborough, originally had four walls. As the rain had ceased the way was taken through the fields to the camp. Those who had not seen it before could not refrain from expressing their admiration at the long extent of solid grey masonry, streaked with regular lines of red tiles, and here and there covered with a green mantle of ivy. At the north-east angle stands a solid round bastion. Another stands close up to the wall in the mid-distance. A third, at the south-east angle, seems to have slid down from its original position against the wall.

The party having returned to the old walls, Mr. G. E. Fox said that this camp especially guarded the mouth of the Waveney. There might have been a boom across the river to stop the progress of any pirate vessel. From this point Reedham could be seen, the site of another Roman station, which guarded the mouth of the Wensum. To the east, within signal distance, was the great camp of Caister, near Yarmouth, to protect the mouth of the Bure and the passage from the northern ocean into the wide salt lake of Breydon. A signal-tower, chiefly of timber construction, was probably erected at this camp to enable its occupants to communicate with the other camps. Such towers may be seen represented in the *bas-relief* of Trajan's Column as rising above the walls of the camp, so as to command a view of a wide extent of country. During the Roman occupation of this camp the water could scarcely have been much higher than it is at present. There is little doubt that there were towers on the west wall, as there are towers on the other walls. On the towers are holes in which to place balistæ or huge crossbows, which would fling out 6-ft. javelins, that would cause considerable impediment to the progress of any pirate vessel up the river by smashing its oars and damaging the crew. The towers, all of which have these holes for balistæ, are of peculiar shape. To about 6 ft. from the ground the towers are not bonded into the wall. The wall and towers are certainly of the same date. Of the ditch, a very important thing in a Roman fortification, there are traces on the south side. On the east side it has been filled up. It had been frequently said that there was a Roman cemetery at Burgh, but he had never seen a Roman urn from Burgh. Those he had seen figured as found at Garianonum were Anglian. Pressure of time compelled Mr. Fox to cut short his remarks; but before concluding he expressed the hope that the interior of Burgh Castle would be properly explored, said that the work of Harrod, which was well done, was a monument of his fame, and advised those who sought for remains of the west wall of Burgh to look for them in Reedham Church, which was built out of a considerable portion of its materials. Whilst the party were at Burgh Castle the rain again came down heavily, but soon passed away again, and the party returned to Norwich, in good time for dinner and for the evening meeting. Here, under the presidency of Sir Talbot Baker, a very interesting paper was read in the architectural section by the Rev. Prebendary Scarth, of Bath, upon a newly-discovered Roman temple, dedicated to the Gallic Mercury, on the summit of Puy de Dôme, one of the highest mountains in Auvergne. From this paper it appeared that the summit is 4,200 feet high,—about equal to our Ben Nevis—that it has long been occupied by an observatory, and that about thirty years ago, in making some alterations near the top of the mountain, the workmen came upon some débris of work evidently Roman, of which due notice was taken by the public librarian of the neighbouring city of Clermont. It was not, however, till a year or two later that he obtained leave to carry out an investigation into these masses of stone; and, finally, in 1873 a commission was appointed by the Emperor of the French, when the work was commenced in earnest. It was then found that the stones were angular and well cut, and that many of them bore inscriptions, which were generally defaced. The masonry proved to be very good specimens of what is known as *opus quadratum*, and the researches being continued, brought to light parts of a flight of stone steps, the balustrades of a staircase, a hall, and an undercroft or crypt. At last the workmen came upon a mutilated statue, and near it was an inscription on a votive tablet, stating that it was dedicated to the Auvergnian Mercury, the god of business transactions (*negotiatori*). This character of Mercury tallies with the words of Ovid in his "Fasti," and it is worthy of note that the statue itself is mentioned by Pliny as being the work of a Roman sculptor, who afterwards designed the golden statue set up in honour of the Emperor Nero. If this be so, the temple and statue belong to the first century of the Christian era. The temple itself must have been very costly in its erection, as the materials had to be transported partly from the Carrara mountains and partly from Africa; the roof, too, would appear to have been covered with lead, and it is reckoned that the statue alone must have cost some 3,500*l*. This temple and its statue were both destroyed, in all probability in a fit of iconoclastic zeal, by the Vandals, in the reign of the Emperor Valerian; for the idea of its having been overthrown by an earthquake is negatived first by the fact that all traces of volcanic action in Auvergne are of an earlier date than Christianity, and secondly by the fact that the inscribed stones are those which are most severely mutilated, which could hardly have been accidental. The reading of this paper gave rise to a brief discussion, in which Sir Talbot Baker, Mr. James Hilton, and other members took part; and afterwards, in the same section, a paper was read by Dr. Raven upon some "Mediæval Instructions in the art of Bell-founding, by Walter de Oddington, a monk of Evesham."

In the other, or Historical, section, the Rev. W. Hudson read a paper, chiefly of local interest, upon "The Traces of the Early Development of Municipal Organisation in the City of Norwich."

On Saturday, the 10th inst., the excursionists went far afield in the north of the county, arriving by train at Holt between 11 and 12 o'clock. On their arrival, after taking only a passing glance at its fine parish church, the party drove down the valley of the Glaver, past Letheringsett Church, with its remarkable round tower, and past the ruins of Glandford Church to Cley-next-the-Sea, a quiet little town, once a port, but now choked up by sand, and, therefore, annexed to Wells, which they reached soon after noon. Here they inspected the fine Decorated parish church, under the guidance of Mr. St. John Hope. The church is said by Mr. Walter Rye to be a "very fine one, and well worth special notice, though partly in ruins"; it certainly has a very fine tower, and contains several interesting brasses. The room over the southern porch, or parvise, still contains the ancient wooden press or locker, of old oak, which was formerly used to contain the copes and other valuables belonging to the parish.

Leaving Cley, the party returned to their carriages, and passing Wiveton on their way without halting, reached Blakeney* soon after one o'clock, and thence proceeded to Binham Priory, between Wells and Fakenham, which they inspected under the guidance of Mr. St. John Hope. The Priory was of the Benedictine order, and was formerly a cell, subordinate to the great Benedictine Abbey of St. Alban's. Very much of the old Norman work still remains as sound as when the Priory was first founded by Peter de Valoignes, one of the nephews of the Conqueror, and his wife, Albreda de la Rye. The nave, which alone stands in a perfect, or, at all events, habitable condition, is used for the parish church. Mr. Rye tells us that, "owing to a dispute as to patronage of this Priory in the reign of King John, about the year 1213, the inmates had to stand a regular siege, and were reduced to drink rain-water and to eat bran bread, which seems to have greatly inconvenienced them; and they were so far successful that the siege was raised by John, who affected great indignation at the event." But the great beauty of Binham Priory, like Crowland Abbey, is to be seen in its west front, which exhibits the most beautiful Early English work, in rows of interlaced arches. This part Mr. St. John Hope attributed to a benefactor of the church about the year 1225. The interior elevation of the church shows three tiers of seven arches on each side; the two lowest are purely Norman, of semicircular shape, but some arches in the highest tier are pointed. The font is fine, even for Norfolk. The remains of the Priory are more fully and technically described by Mr. Harrod in his well-known work on "The Castles and Convents of Norfolk," pp. 198 *et seq.* Mr. St. John Hope led the party round the remains of the other portions of the church and priory, which may still be detected by a practised eye as they lie under the ridges of the grassy turf, to the east and south.

The party left Binham at four o'clock for the station at Melton Constable, returning thence to Norwich.

The papers read at the evening meeting (Mr. J. T. Micklethwaite, F.S.A., Vice-President, in the chair) were two,—the printed programme being, *pro hac vice*, altered. The first was by Mr. G. E. Fox, F.S.A., on "The Painted Screens and Roofs of Norfolk;" and the second by Mr. Longden, on "Early Ironwork." The paper of Mr. Fox was beautifully illustrated by water-colour drawings and diagrams hung on the walls; and it showed the Congress that he is a master of many subjects, and knows them all thoroughly. He stated that elaborately-painted screens, though so frequently met with in Norfolk and Suffolk, are almost unknown in the other counties of England; and he attributed their execution and preservation to the existence of a native school of art in East Anglia, which possibly may have been largely influenced by the Flemish painters on the other side of the sea, whose works would naturally be imported into these parts by way of Yarmouth, Lynn, and other ports. As to the screens, he said that their especial feature was that each panel or compartment was occupied by a single figure. These figures were usually, but not universally, twelve, and most frequently represented the twelve Apostles. If the panels of the central gates, as well as the side compartments, were painted, the two extra figures were usually St. Helen and St. Agnes, or two of the chief local saints. If the panels were four in excess of twelve, they were generally filled with figures of the four great doctors of the Church. In any case, the colouring both of the figures and their drapery, and also of the background, was mostly bright and gay, the latter being generally

* A sketch of the characteristic east end of Blakeney Church, and another of part of the arcade of Cley Church, will be found in the *Builder* for August 10.

SMOKING AND BILLIARD RO

MESSRS. ROMAINE-WALL

RD ROOMS, CAMFORD MANOR, DORSET.

E-WALKER AND TANNER, ARCHITECTS.

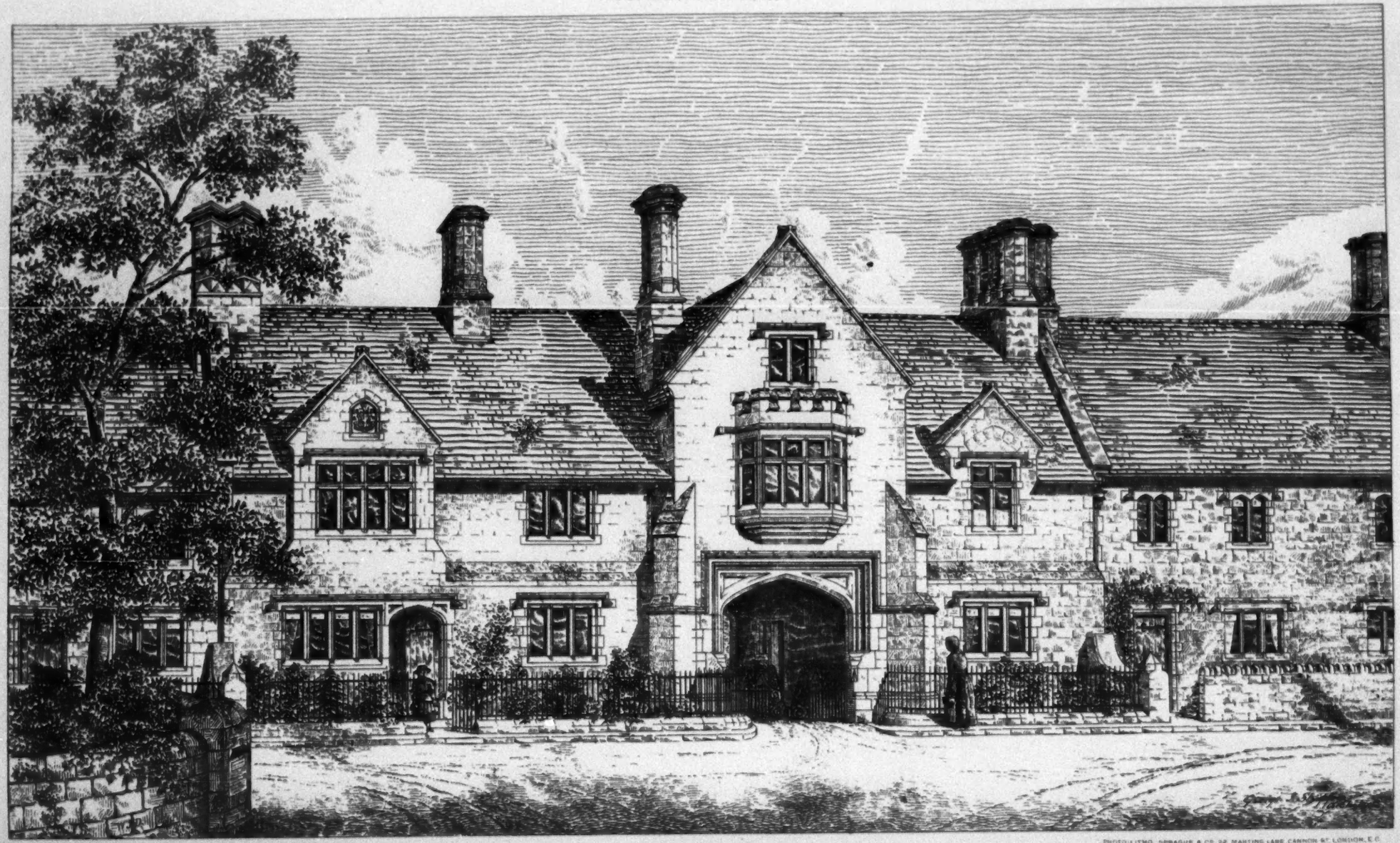
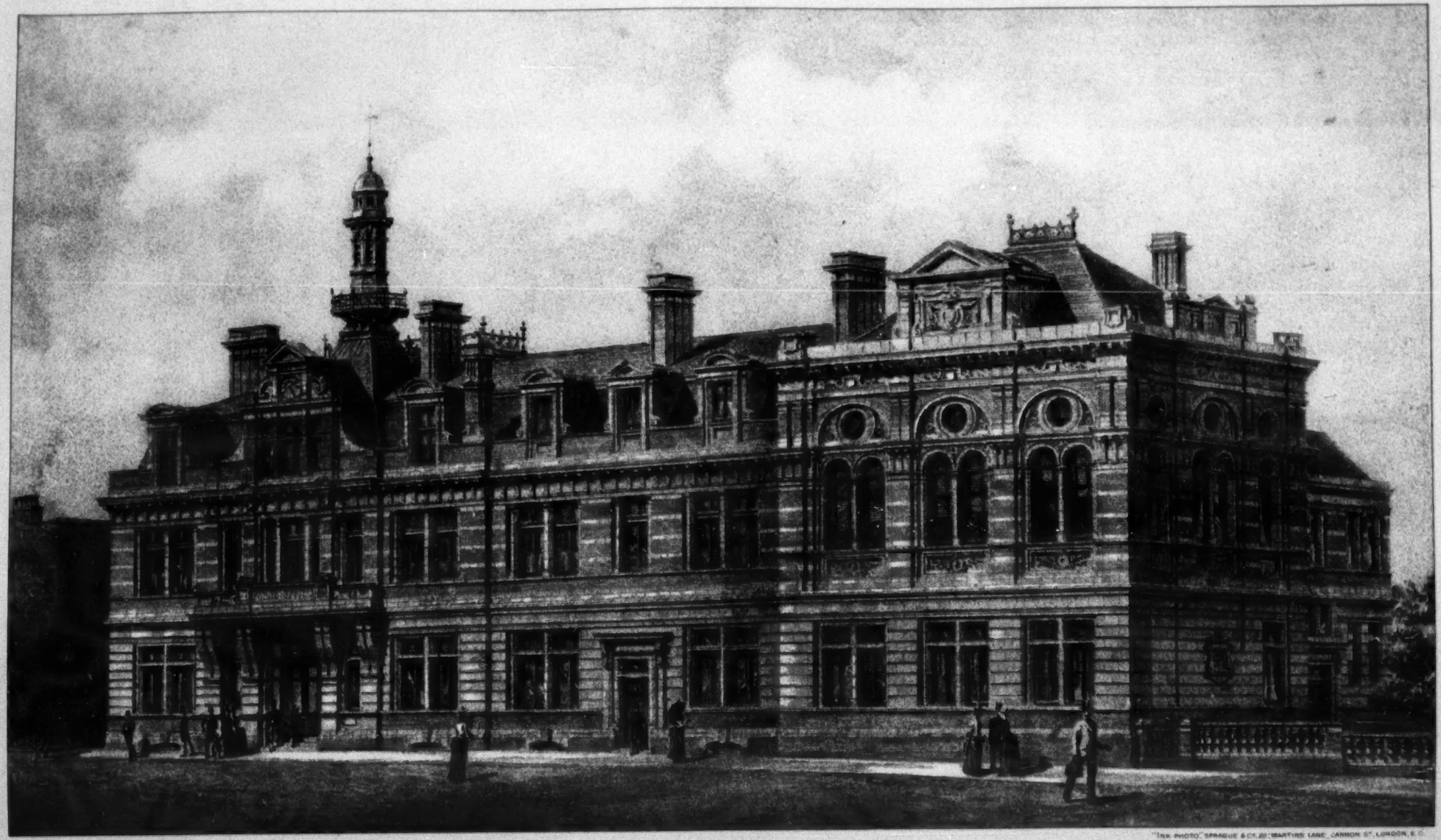


PHOTO-LITHO. SPRAGUE & CO., 22, MARTINS LANE, CANNON ST., LONDON, E.C.

COTTAGES AT DOULTING, SOMERSET.—Mr. George J. Skipper, F.R.I.B.A., Architect.



"INK PHOTO," SPRAGUE & Co., 63, MARTINS LANE, CANNON ST., LONDON, E.C.

RICHMOND MUNICIPAL BUILDINGS COMPETITION.—SECOND PREMIATED DESIGN.

MR. T. VERITY, F.R.I.B.A., ARCHITECT.

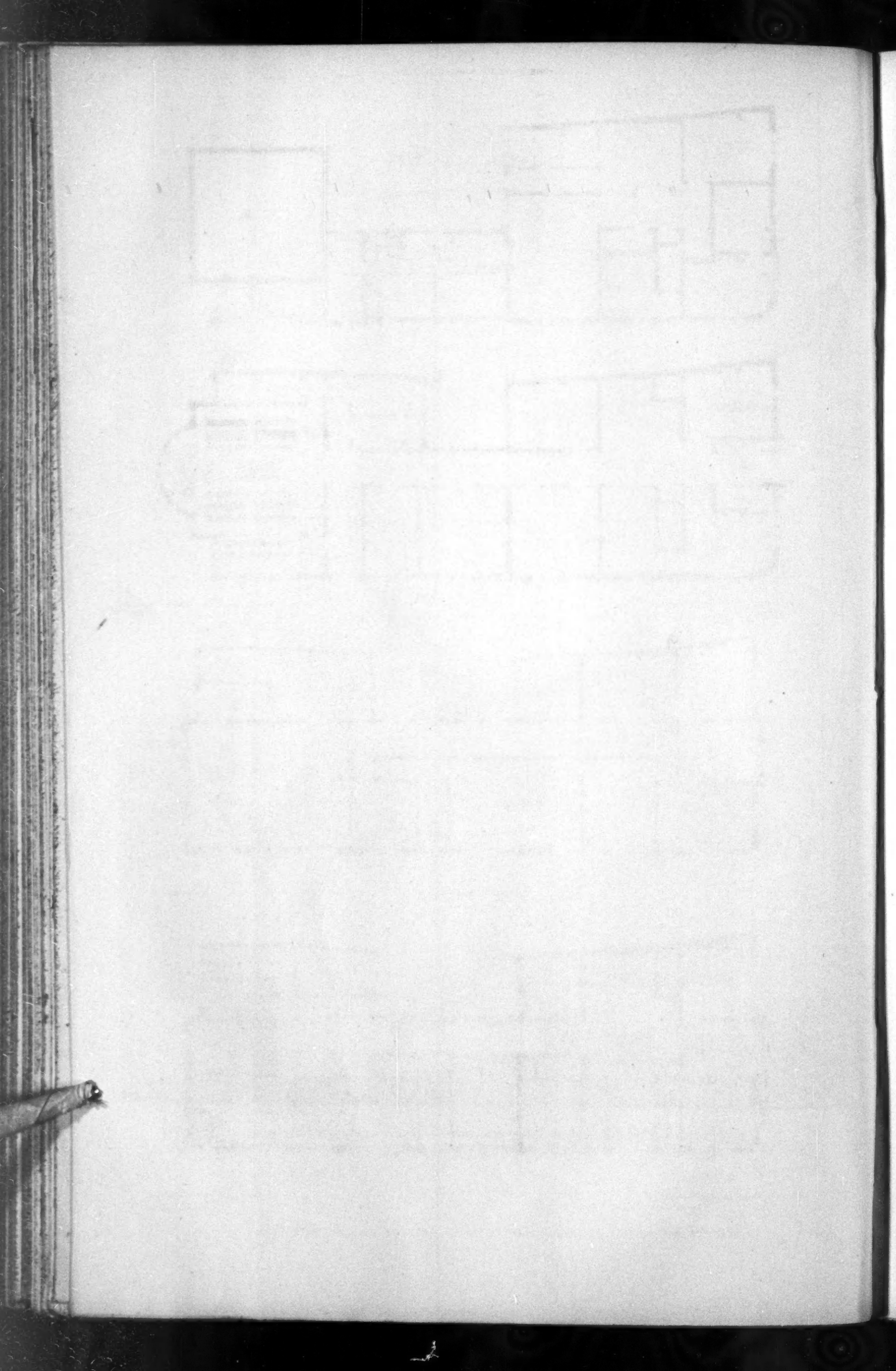
"TRIX-PHOTO," STRAGUE & CO.,62, MARTINS LANE, CANNON ST., LONDON, E.C.

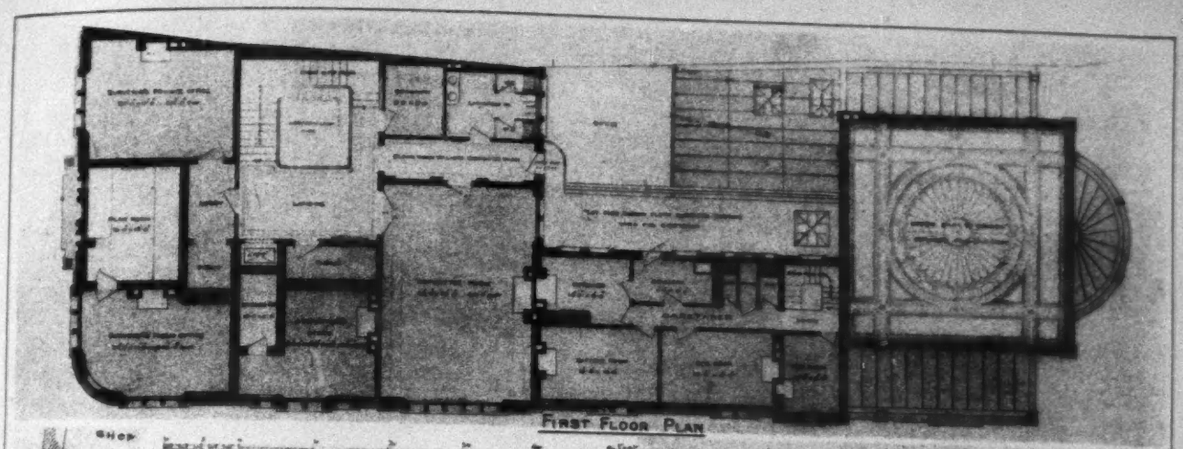
RICHMOND MUNICIPAL BUILDINGS COMPETITION.—FIRST PREMIATED DESIGN.

MESSRS. ELKINGTON & SON, ARCHITECTS.

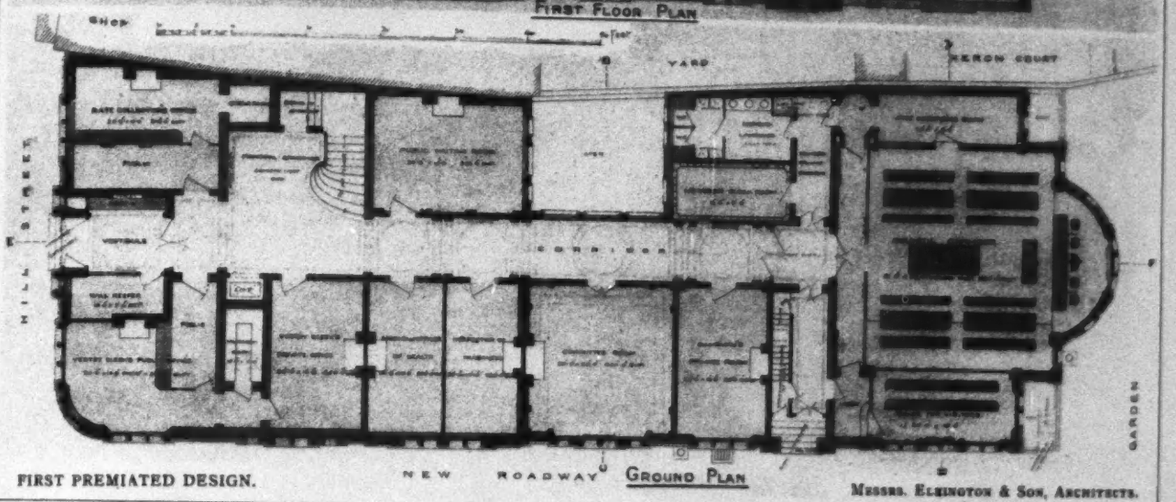
RICHMOND MUNICIPAL BUILDINGS COMPETITION.—FIRST PREMIATED DESIGN.

MESSRS. ELKINGTON & SON, ARCHITECTS.





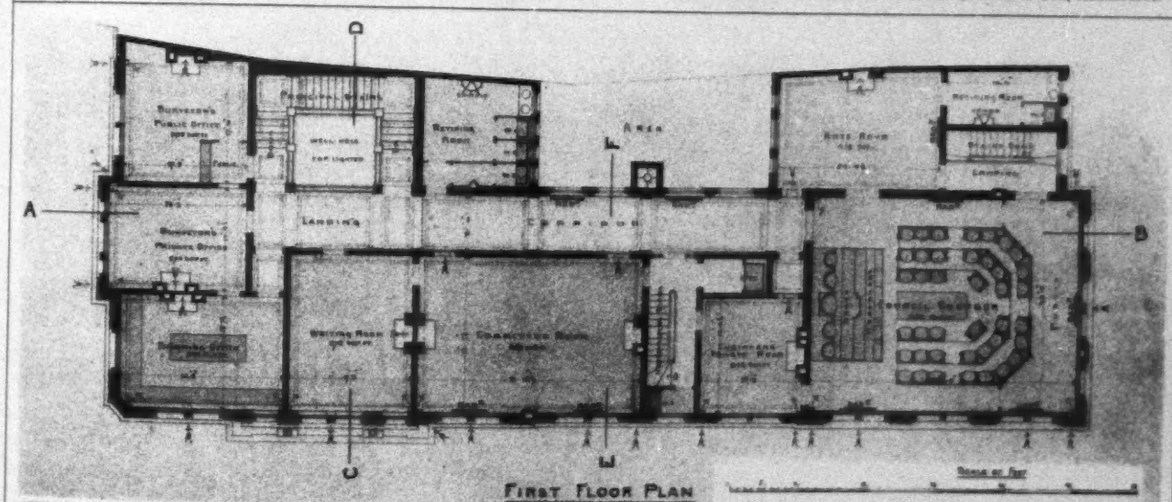
FIRST FLOOR PLAN



GROUND PLAN

FIRST PREMIATED DESIGN.

MESSRS. ELSINGTON & SON, ARCHITECTS.



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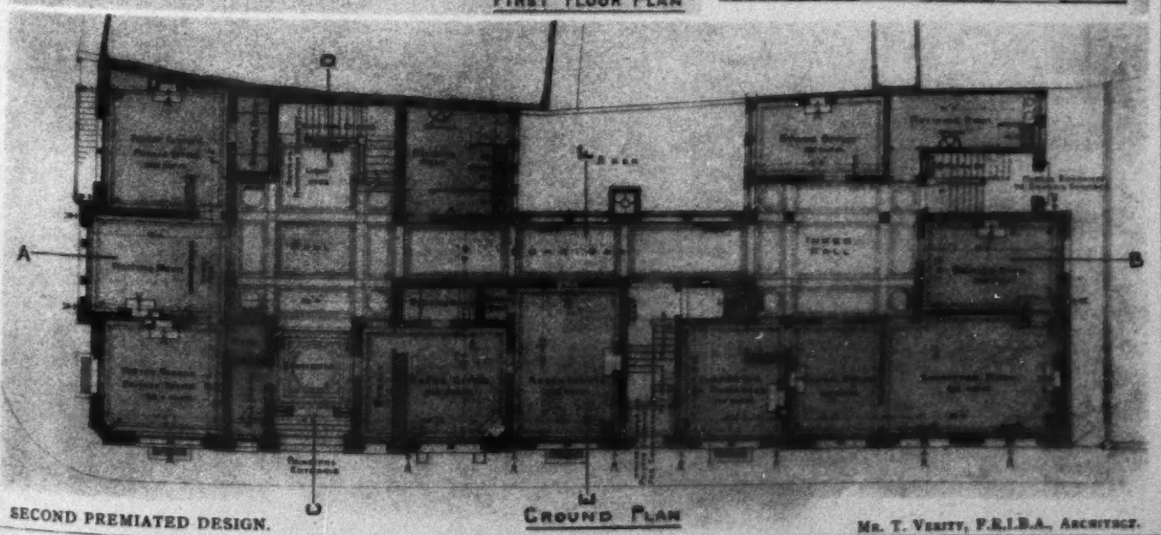
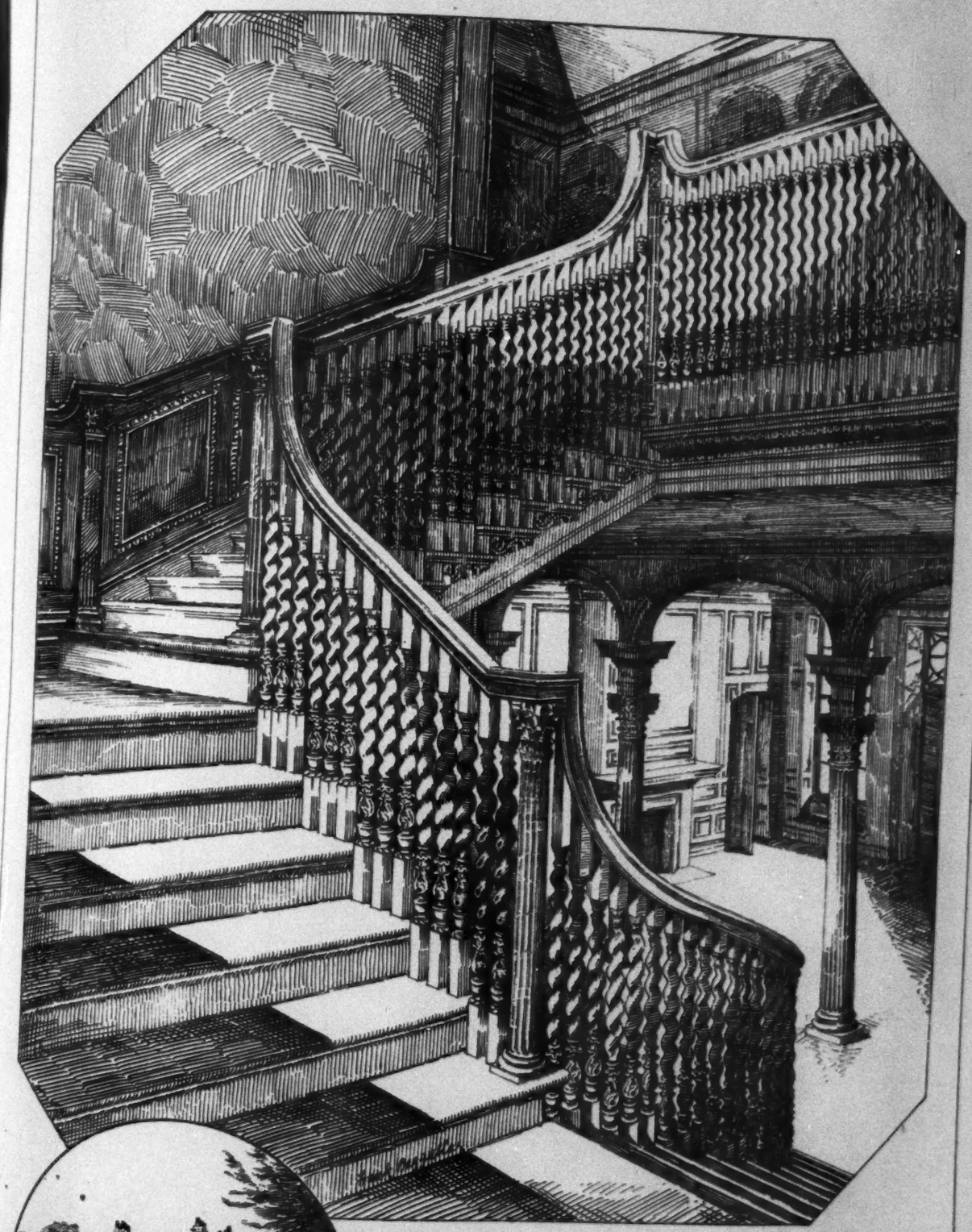


GROUND PLAN

SECOND PREMIATED DESIGN.

MR. T. VERITY, F.R.I.B.A., ARCHITECT.

RICHMOND MUNICIPAL BUILDINGS COMPETITION.—PLANS OF THE PREMIATED DESIGNS.



The Old Manor House.

Wandsworth.

Staircase & Garden Front.

WHITE LITHO. STRAKER & CO., 32, SHEFFIELD LANE, CANNON ST., LONDON, E.C.

either blue or green. In one instance (at Aylsham) Moses appears in the company of the saints of the New Testament, as also does John Shorne, of Dunstable, who had the reputation in the pre-Reformation times of being able to beat Satan on his own ground. Mr. Fox gave several detailed descriptions of screens, more or less perfect, at Sall, Corston, and some ten or twelve other places, but he decidedly gave the palm of all to Ranworth, where the decoration of the panels does not consist of the regulation saints, but represents the heavenly hosts, the Cherubim and Seraphim, accompanied, however, by St. Barbara. The screen in another Norfolk church which Mr. Fox mentioned was treated, he said, in a different manner altogether, the figures of three other Christian kings of the mediæval times, and our own King, Henry VI., being represented on its panels. As to the roofs, he divided them into three classes:—1st, those in which the plain oak roof was picked out in colours; 2nd, those in which all the surface was coloured, the rafters being picked out in brighter colours than the rest; and, 3rd, those in which the treatment was still more elaborate, the compartments being filled with the sacred monogram, or where the initial of a saint was repeated, usually in a wreath, the rest of each compartment being filled with angels, flowers, the seraphim, &c. The roofs, added Mr. Fox, were executed in tempera, but the screens were painted in oils. The art of decoration was at its best in England from about 1375 to 1500, and Norwich, he thought, was the centre of that school of art. The reading of this paper elicited some few remarks from the Chairman, which were followed by a short discussion and a vote of thanks to its author.

The other paper, on Ancient Iron Metal Work, gave a brief account of the art as it was practised in England, from the thirteenth century downwards. This art showed itself chiefly in those wide-spreading and elaborate hinges on church-doors, of which we see specimens at Durham, at Merton College, Oxford, at the Grammar School in Norwich—the latter closely resembling that on Queen Eleanor's tomb in Westminster Abbey. In the fourteenth century this work grew more elaborate, as the use of the hammer came to be applied to more elaborate designs. Mr. Longden gave some account of the payments received by workers in iron, which showed that they were regarded as craftsmen of a superior kind; and he argued that a school of this art could be easily revived. A member of the Congress having drawn attention to the great difference to be seen in such metal work to the north and to the south of the Tweed, Mr. G. Lambert rose and remarked that the revival of such a school was merely a matter of pounds, shillings, and pence, and that if persons were found who would encourage its growth by generous payments the art would soon flourish again. *Sint Mœcenates, non deerunt, Flacce, Marones*, is a saying as true now as it ever was. The "Norwich gates," shown at the Great Exhibition, and now at Sandringham, showed that Norwich, let alone England, was quite ready to produce metal work equal in execution to that of the thirteenth or fourteenth century. The Chairman remarked that he did not dispute such being the case as to that part of the art which consists in execution, but he doubted whether equally beautiful designs could be devised now, as the feeling which produced them no longer existed. A hearty vote of thanks for his paper was accorded to Mr. Longden, who made a few observations in reply.

On Monday, the 12th, soon after breakfast, in spite of heavy rain, the party were *en route* by train for Cawston, celebrated for its freestone tower, which apparently was rebuilt on a larger plan than originally in the fourteenth century. But the church, as Mr. J. T. Micklethwaite pointed out, is interesting, not so much for its fabric and for the evidences of its enlargement, as for what it still contains of pre-Reformation furniture and decoration, in which point it is surpassed by no other church in East Norfolk excepting Sall, with which it agrees in general plan. This rich furniture is a proof, he said, of the wealth and prosperity of the middle classes and of the trading community, which seems to have continued in the eastern parts of England in spite of the Wars of the Roses, which played such havoc in the west. As the chancel of this church was burnt down, the existing work, except some early stalls, is rather modern. The transepts are low and small, as is often found in Norfolk. The fifteenth-century screen, though a wreck of its former beauty, still shows traces of elaborate painting. On the panels of the doors on the one side are the Twelve Apostles, and the Four Doctors of the Church, and on the other side are conventional portraits of saints, among whom figures Sir John Shorne, the monk of Evesham, who conquered, or had the reputation of conquering, the devil. The rood stood under a canopied roof, which was rather a singular arrangement; and the angels which decorate the hammer beams of the roof are not cut out of them, as is usual, but perched upon them. In the church are some also Mediæval seats of rather unusual form. They had no backs. One has a kneeling-board, on which a person could support himself in a half-kneeling and half-standing attitude. Attention was also drawn to a curious piscina in the north transept, with a wild man carved on it, in which possibly is a latent allusion to the name of the donor, possibly a Woodman.

Passing on to Sall, Mr. J. T. Micklethwaite explained this church also. It is remarkable not only for its size and lofty proportions, but for the proofs which it still gives as to the habits of three centuries ago. From what remains of the church it is quite possible to make a plan of it as it stood in the pre-Reformation days. The chancel has no aisles, but there are two little transepts, of paddle-box form, which Mr. Micklethwaite said belong to the aisles rather than to the whole church, and which seem to have been put in because altar-space was required. There were once five altars in the church, and before and about these were many very fine flat tombstones, some of which are still *in situ*, whilst others have but set up against the walls. One of these, which Mr. Micklethwaite called a "Corpse-Brass," is curious as representing a corpse in a winding sheet, with a quaint *memento mori* inscription. The nave is lofty, and the roofs, so far as their decoration is concerned, are perfect. The old font bears the Seven Sacraments in high relief, and still has its old tall cover, which is worked by a sort of crane. The old stalls in the chancel, with their carved seats, remain, but the screen has been mutilated, probably in order to enable the zealous reformers to get rid of the rood loft above it. Mr. Micklethwaite considered that at each end of the screen was a wooden tower or turret with steps, by which ascent was gained to the rood loft. In the transepts were side chapels, partitioned off by screens, but these screens have been cut up as materials for pews. The pulpit, which stands in its original position on the south side of the nave, is of about the same date and pattern as that at Cawston. Over each porch is a parvise, that on the south being traditionally known as the "Soldier's Chamber," and that on the north as the "Old Maid's Chamber"; but the meaning of the tradition has been lost. Such little chambers, he believed, continued to be used and inhabited long after the clergy had ceased to occupy them. The chancel roof is beautiful; but Mr. Micklethwaite said that "it really has no business to stand, for it has no ties to support it; it simply stands on account of the firmness of the walls against which it leans." In the bosses of the chancel roof, as is the case in the nave and in the cloisters of Norwich Cathedral, can be read an epitome of the Gospel history. The desk is of the time of James I., and, in accordance with the instructions from Canterbury of that date, it faces eastwards for reading the prayers. The tables of the Ten Commandments and the Lord's Prayer are here, strangely enough, in their proper place, at the east end of the nave, where the people can read them, and not at the east end of the chancel. Mr. A. Hartshorne drew attention to a rare helmet, hanging on the east wall of one of the transepts, which he said is a combed burgonet of about 1540, and formed part of a funeral achievement. Before quitting the church, several members of the Institute called attention to the sad condition of the roofs both here and also at Cawston, which let in the rain, and which, if something is not done to stop decay, will some day perish; and Mr. G. Lambert remarked that there are in the parish chest some loose brasses which ought to be fixed up in the church, or they will some day be "missing." Mr. Micklethwaite observed that in order to save these two roofs, it would perhaps be necessary to appeal beyond the parish to the county of Norfolk, of which they are such great ornaments; but they should be "repaired" in a conservative spirit, not "restored."

From Sall it was no long drive to Heydon; and the party repaired to the parish church, a Perpendicular building, but containing some good work of the Decorated period. The pulpit, Mr. Micklethwaite observed, is a good example of what is profanely called the "wine-glass" shape; but he hesitated to accept the font as a genuine specimen of Norman work. General Bulwer exhibited two gilt-headed maces which had been carried before the Earles, as Lords of the Manor of Heydon and Cawston, when holding their courts. One of them is headed with a brazen hand or gauntlet, the rebus of John of Gaunt or Gant, Duke of Lancaster. The hand grasps a ploughshare in order to show that the Manor is held in fee socage and not *in capite*. The top of the other mace represents a bearded arrow, by which tenure a part of the town or ville is "held in fee socage of the Lord." The present shafts of the maces were executed in 1637, and bear the arms of Erasmus Earle, Serjeant-at-Law, a personal friend of Oliver Cromwell, who visited him at Heydon, and of whom there are many relics and souvenirs in the ancient hall.

The next place visited by the archæologists was Blickling Hall,* where they were welcomed by the owner, the Dowager Marchioness of Lothian, and her sister, the Countess of Pembroke. The party, being inconveniently large, was here divided, and while one portion strolled through the beautiful Old English and Italian gardens, while others inspected the picture-gallery and great library, and admired the compartments of its ceiling, richly adorned with emblems, after the fashion so prevalent in the reigns of Elizabeth and James I.; others, again, looked over the almost unique collection of rare books and manuscripts, including an Anglo-Saxon MS. book of sermons, early copies of Chaucer, and several of the first editions of the ancient Classics. The Rev. Mr. Meyrick, the Rector of Blickling, said that the manor of Blickling belonged, more than eight centuries ago, to Harold, when he was "Earl" of East Anglia in the reign of the Confessor, and afterwards passed to the Dagworths, the Erpinghams (after one of whom the great gateway of the Close at Norwich is named), and the Falstolfs, from whom it came to the Boleyns. In the reign of Elizabeth the manor was bought by the founder of the House of Hobart, who rebuilt the hall; and it had remained in the hands of successive Hobarts, Earls of Buckinghamshire, down to the present century, when the estate was carried by the marriage of a Hobart heiress with the Marquis of Lothian.

The church was next visited. It is a very beautiful building, but rather too elaborately "restored" to suit the tastes of genuine archæologists and ecclesiastical antiquarians. We gave a sketch of the font in the lithograph plate published August 10.

On Tuesday, the 13th, the weather, though dull, was fairly fine, and the party went by train to Wroxham, where carriages were ready to convey them to Barton Turf, Tunstead, North Walsham, Trunch, and Knapton. At Barton Turf Mr. Micklethwaite, in explaining the church, showed what destruction had been wrought by a well-meant attempt to "restore and beautify" the fabric towards the close of the last century. The church is of the fourteenth century, but was much altered in the fifteenth century, as was the case with so many other churches where the parishioners were prosperous and wealthy. The screen, he said, narrowly escaped being painted over, and it is especially worthy of notice. On the north side are figures representing the Seraphim, the Dominions, Virtues, Powers, St. Zita, and St. Apollonia; while on the south are the Cherubim, Principalities, Thrones, Archangels, Angels, and, lastly, St. Barbara; and, doubtless, the Four Doctors of the Church were once on the panels of the doors which are "missing."

The next church visited, that of Tunstead, was explained by the Rev. C. R. Manning, who drew attention to the windows as good specimens of the transition from the Decorated to the Perpendicular style. "The most curious feature," he said, "in the Church is a chamber below a platform at the back of the altar, extending from one end to the other. It is approached on the north side by a flight of six stone steps; and on the south side is an entrance leading down to the chamber under the platform. The chamber is lighted by a grating. Was it a sacristy? or was it a place for depositing the relics of a saint? or was it used to represent the entombment of and resurrection of Christ in some kind of 'Mystery' or play?" Mr.

* A sketch of Blickling Hall was given in one of our illustration pages for August 10.

Micklethwaite's opinion was that this platform was the base of the very elaborate reredos, and that the coloured spaces in front were used for the display of images; if so, the steps would be for convenience in order to reach the reredos for this purpose. Father Hirst and Canon Duckett were of opinion that the platform was used for the exhibition of the consecrated Host, as the Church is a very large one, and that the chamber below may have been used as a "confessio." The north side of the aisle has a singular appearance, from the fact of the walls and pillars being out of the perpendicular.

On the way to North Walsham Mr. J. Mottram, who here acted as guide to the party, pointed out a cross which serves as a memorial of the "Peasants' Revolt" at the time when Wat Tyler put himself at the head of 30,000 of the lower order, who demanded, with arms in their hands, a redress of grievances.

On arriving at North Walsham, the party visited the parish church, which is large and imposing, consisting of a nave and aisles without any special chancel. "This," said Mr. Micklethwaite, "is a different type of church from any they had hitherto seen. It is a very good example of the tendency of the later churches to develope the plan which was like that of the basilica. Architecturally nothing could well be more different from the basilica. But it is curious how similar conditions brought about a similar plan with totally different architectural treatment. The early basilica arose from the necessity of accommodating large congregations who took a more or less intelligent part in the service. Later on, when the language in which the service was used became hardly understood, the arrangements of churches altered, for there was not the same desire to bring everybody within range of the high, or one altar. Later still the people followed the ritual, though they did not understand the words of the service, and there was a desire to come more within the range of the high altar. That led to the gradual throwing, as here, all the church into one. Originally the church consisted of nave with chancel, but the division, except for the screen, the lower part of which remains, was gradually lost. The taking away of what divided it seems to have been done in the fourteenth century. Thus the people were better able to see the altar than when there was an arch with heavy pillars practically cutting off the chancel. A church thus arranged had, he supposed, when fully developed, stalls within the screen. At the east end of each aisle is a chapel walled off from the centre of the church. At the back of the sedilia in the south wall is a broad arch that was used as a squint for people sitting on the far side of the south chapel, that they might see the high altar. It was doubtless the intention of those who built the arcades to put up a clearstory, which would have made it a very lofty church. On the screen, which stands a long way in front of the inner walls forming the chapels, are figures of the apostles, and an unusual one of the Annunciation showing the angel, one of those strange feathered monsters, in a dalmatic. Signs of a transition in doctrine are visible here in a large communion table, enriched with carving, to be seen in what was the South Chapel. It is of very late Perpendicular period, touched with Elizabethan. Upon its rim is the inscription "The body (and blood) of Our Lord Jesus Christ, which was given for the preserve thy body and soul unto everlasting life. Amen." The words "and blood" have been superadded. Mr. Micklethwaite expressed an opinion that this table was not originally intended for ecclesiastical use, as there are marks of feet on the ledges below. Possibly someone, thinking it would serve as a communion table, gave it to the church.

North Walsham Church is also noteworthy for a very fine Renaissance monument, in the chancel, to one of the Paston family, of which we will give an illustration next week. It contains also some fine pieces of mediæval wood-carving, some *in situ* (bench-end heads), and some which formed part of a screen, and are preserved in the church. In the *Builder* for Sept. 24, 1887, we gave a sketch of a good Renaissance chair which is part of the furniture of the chapel now used as a vestry. The western half of the tower, which is of flint rubble with no bonding stones, fell about sixty years ago, and it still remains a melancholy ruin.

Trunch Church, which was the next halt of the party, is well known to ecclesiologists from having been so well described and illustrated by local art. The chief objects of interest here are the beautiful roof, and a very rare and elaborate self-supporting font-cover, which is richly carved in oak, and was formerly ornamented with colour and gilding. It is, in fact, a cover not resting on the font itself in the usual way, but supported by slender wooden pillars outside the font so as to form an hexagonal inclosure, beneath which the baptismal service may be administered. This form of font is extremely rare. The church is also remarkable for its well-known and very fine roof, with spandrels filled with pierced work in geometrical design.

From Trunch the party drove on to Knapton Church, where the nave presents, at all events, one special object of interest, a grand double hammer-beam roof, on every point and angle of which stands an angel, and most of the angels, over a hundred in all, are richly coloured. In a report on the proposed restoration of the nave of this church, Mr. Gilbert Scott remarks:—"This roof is the especial glory of the church, and is a particularly fine example of the double hammer-beam construction, while its interest and its beauty is enhanced by the admirable coloured decoration, of which the greater portion remains intact. But this roof must be seen; it can hardly be described in a manner to give an idea of the effect of the numerous angels looking down from equi-distant receding points upon the floor of the nave. Truly the men who wrought and painted this roof were artists, and at the time they lived the country around, now so thinly populated, must have been pretty thickly inhabited with people who were well to do."

The font, and its elaborate cover, which originally was let down from a beam, to which it is still attached, by the adjustment of a balance-weight, was much admired.

From Knapton it was but a short drive to Paston, and none who have read the "Paston Papers" can pass the ancient home of that family without recalling several incidents mentioned in that celebrated correspondence. The present inmates of the Hall, which occupies the site of the former residence of the "Good Judge," as he is called, stood at the gates to see the party drive by.

In their way back to North Walsham the party resolved, as time allowed, to make a hasty inspection of the ivy-clad ruins of the chancel at Bromholm, a special interest attaching to this as a spot the memory of which lives on in the pages of Chaucer; for it will be remembered, by some at least, that in the Reeve's Tale the miller's wife cries for help to "the Holy Cross of Broomholm." The reporter of the *East Anglian Daily Press* writes:—"The lordship of William de Glanville at Bacton was bounded by manors of Earl Warren, whose interest in the Cluniacs may have induced him to found for them this Priory at Bromholm as a cell to Castlecre. 'The Holy Cross' brought the Priory fame and wealth. That relic is said to have been thrown by a Lollard parson in the fire about the end of the fourteenth century. The Priory remains consist of later Norman and early English work. Somewhere in the field now waving with corn growing over the site of the chancel rest the remains of John Paston, whose 'wake' was celebrated with a great feast, and at whose funeral the torches in the church smoked so furiously that the windows had to be opened to let out the fumes." The stay of the party at Bromholm, however, was very short, for the inexorable bugle of their guide sounded to tell them that it was time for the carriages to drive on to North Walsham, in order to return to Norwich.

Wednesday, the 14th, was the concluding day of the Congress, and the last excursion was so planned as to give the party a sight of some of the Norfolk "Broads;" and a steam launch was to have been ready on the arrival of the train at Wroxham to take them to Ranworth and Acle. But, unfortunately, the steamer could not, or did not, arrive to its time, and in consequence the party separated, some resolving to return to Sallhouse and walk on to Ranworth, while others went back to Norwich. But "everything comes to those who wait," and the steamer arrived after an hour's delay, and took the rest, about sixty in number, on a cruise past Wroxham, Hoveton, and Sallhouse Broads. In the course of their voyage, Dr. J. E. Taylor pointed out to the party that these "Broads," as it has been observed by geologists, occur, as a rule, in the concave bends of rivers. If any occur on the convex sides, they are generally filling up, or else are already filled up. It is just possible that in these filled-up "Broads" may be found remains of crannoges, or lake dwellings, like those discovered some twenty years ago at Trowse, near Norwich, when deep excavations were made for the sewers. That the valley of the Bure is a very ancient one may be seen by its having been cut through by some of the lowest and most recent of the Pliocene and Pleistocene beds. At the bottom of the German Ocean there are hollows well known to dredgers who bring up peat, and across it is a channel through which the Thames continued its course past Suffolk and Norfolk, and possibly effected a junction with the Rhine. Could the bottom of the German Ocean be raised up, it would be seen to be, as an Irishman would say, the Norfolk Broad district in the German Ocean. On landing at Ranworth, the party made their way on foot to the church, which, in spite of its boasting of the finest rood and parclose screen in Norfolk, is in a sad and discreditable state of neglect.

Mr. Micklethwaite, in describing the church, said that here are to be seen what were the arrangements of an ancient but small parish church. "All the old parish churches from the eleventh to the middle of the sixteenth century had at least three altars. But that was sometimes denied, and persons often said that there were no places to be seen in the church for chapel altars. But this church, consisting of nave and chancel, shows clearly the situation of the second and third altars. The high altar with the reredos occupied its usual position; the other two altars were worked up in the screen within a parclose. Arrangements for the old worship are here left, as Mr. Micklethwaite pointed out, that are to be seen nowhere else in England. There is still the rood loft and the rood screen, with its carved canopy and panels filled with figures of saints. Projecting from it into the nave, several feet from each wall, is work in character with the screen that formed the inner side of the little chapel. Behind the screen are the original stalls. Painted on the walls, just where the screen is placed, are two dedication crosses: originally there were twelve of them in the church." Mr. G. E. Fox, F.S.A., next added a few words, expressing his opinion that the screen is the finest in all Norfolk. "Nothing," he said, "can exceed the beauty of its details,—the diapers and the dresses of the various figures. The manner in which the screen was painted is shown. The figure of John the Baptist was never finished. The wood was covered with a thin coating of plaster, which was carefully rubbed down and smoothed. Upon that, when properly prepared, the figure, with all its accessories, was drawn with extreme care. Then the various colours were applied. But another question arises; were these figures painted in oil or in tempera,—that is, in colours mixed with size or honey, and not with oil? It is simply impossible to say which has been used in these paintings. The older painters who painted in tempera had a certain peculiarity of touch which they continued when they adopted oil, so that we cannot distinguish whether these paintings are in oil or in tempera." Reverting to the subject which he had touched on in a paper read at one of the evening meetings, and dealing with the question as to the men who painted this Ranworth screen, Mr. Fox said that it is on record that there were 28 painters practising in Norwich at the end of the 14th and the beginning of the 15th century. Their names show that they were Englishmen, not foreigners. They were all men of Norwich or of Norfolk birth, and settled in the city. "There being so many of them rather implies that there must have been some work for them to execute constantly. Throughout Norfolk, where there was an immense number of painted screens, these men were no doubt employed in painting them. How much of their art they derived from their Flemish brethren is a subject requiring a considerable amount of investigation. In this screen there are slight traces of Flemish art,—in a head-dress, a sword, or the form of a shield,—which may have been derived from Flanders, but not enough to justify us in saying that the Flemings came and executed the work."

Mr. Micklethwaite next called attention to a very curious old lectern, which has the peculiarity of having two desks, the one above the other. In all probability it was intended for use in the chancel, as it bears as its inscription the opening words of St. John's Gospel:—"*In principio erat verbum.*" On the other side is a lower desk, and above it vertically a desk with the Doxology, with the music from the ordinary

metrical hymns, so that should the man who was singing forget the words of the Gloria he had them before him.

One member of the Congress, Mr. Gostenhofer, here pointed out the unhappy condition of the roof of the church, through which daylight was visible in several places, and suggested that those who had derived pleasure and instruction from a study of these East Anglian churches, with their painted roofs and screens, should contribute something in aid of its repair,—with the result that a few pounds were collected on the spot.

The party then went on to Acle, some by water and others by land, passing on their way the ruins of St. Benet's, or St. Benedict's, Abbey, one of the oldest of the many monastic buildings of Norfolk, as it was founded by Canute some years before the Conquest; one which incurred the anger and wrath of the Conqueror, and was beseiged by him fruitlessly, and in whose cemetery many nobles and knights were laid to rest. It was a Benedictine house, subject to the great Benedictine Abbey of St. Albans. Want of time and the wetness of the day, however, conspired to debar the members of the Congress from a careful inspection of the ruins of this interesting place; and, in a heavy rain, a few of them only went on to Acle. Here, again, the rain prevented all but the most adventurous from seeing the church, though its tower is noteworthy, as being round in the lower portion, while it is octagonal in its upper stages. In the tower is a small *ædicula*, or shrine for an image, but the image is gone. The porch and the tower both contain some curious stone-work. In the middle of a field opposite the church are to be seen two small, crumbling walls and a few swelling mounds, which are all the surviving traces of the once-powerful Priory of Austin Canons, founded here six centuries ago by that bold baron, Roger Bigod, whom we have mentioned in our accounts of Castle Acre and Norwich Castle.

Returning by train in good time, the members re-assembled at Norwich, and informally broke up the Congress. It would not be right to conclude our account of the Congress without adding that both in numbers and in objects of interest it was a great success, and that this success was largely due to the efforts of the local secretaries, the Rev. W. Hudson and Mr. J. Mottram, and to the Mayors of Norwich and Great Yarmouth. During the Congress the Norfolk and Norwich Club opened their doors freely to the members; and the "Art Circle" of Norwich threw open to them, without charge, its fine and extensive loan collection of plans, water-colour drawings, and engravings of the old city, including specimens of Crome, Cotman, Stannard, Marshall, Thurtle, and Miss Nichols, mostly representing the Cathedral, the Close, the old gates, the churches, bridges, courts, and alleys of the chief city of Norfolk, which even now is one of the most picturesque cities in the entire kingdom.

Materials Wanted in Servia.—The British Vice-Consul at Nisch, in a recent report upon the trade of Servia, observes:—"Portland cement is in great demand, and merchants are anxious to trade in the genuine article instead of the spurious ones of Austrian and German make. The Perlmoosa Cement Company, whose factory is close to Kufstein, in the Tyrol, have an agent at Belgrade, and have virtually secured a monopoly of the trade. The Hydraulic Lime and Cement Factory, a Servian firm at Ripangè, near Belgrade, produces an inferior article, which sells for ordinary purposes. The quality of the window-glass, which is chiefly imported from Austria-Hungary and Belgium, is very inferior, and an attempt has been made by Belgrade merchants to introduce this article from England, with such satisfactory results that several additional wagon-loads have been ordered. Among other articles affording opportunities for British competition may be mentioned building tools and paints; but Servia is not yet ready to purchase the highest priced and best-finished goods: cheapness and durability are the principal requisites."

Norwegian Paris Technical Grants.—The Norwegian Government have awarded grants of about 25*l.* to thirteen gentlemen, who either are visiting or have visited the Paris Exhibition, in order to report upon various technical subjects; also a sum of money to Herr Ad. Schirmer, the Norwegian representative of architecture at the late congress.

"COMPOSITION OF ANCIENT MORTAR."

SIR,—On my way back from Australia last April I received in Ceylon an interesting specimen of ancient mortar, over six centuries old, and as the analysis of the same may be of interest to many of your readers, I enclose copy of the results. As printed out in my paper published in the *Builder* of August 18, 1888, the best mortar always contains a considerable proportion of the lime in a state of silicate; in other words, as it exists in good Portland cement, and you will notice that this specimen contained 7·10 of silica present as a silicate of lime, which made the mortar very hard and difficult to break.

JOHN HUGHES.

Analytical Laboratory,
79, Mark-lane, London, E.C.
July 8, 1889.

Analysis.

Sample of concrete six centuries old. Marked from anicut of Giant's Tank, Ceylon. Received from Mr. A. M. Ferguson, Colombo, Ceylon.

Water (lost, at 212 deg. Fahr.)	1.18
Combined water and loss on ignition	2·66
Oxide of iron	2·20
Alumina	2·65
Lime	16·24
Magnesia	·36
Potash	·30
Soda	·17
Sulphuric acid	·58
Phosphoric acid	traces
*Carbonic acid	11·11
Chlorine	traces
Silica (present as silicate of lime)	7·10
Insoluble, siliceous matters	55·45
	100·00

JOHN HUGHES, F.I.C.

CONCRETE FLOORS.

SIR,—I am glad to observe, by the correspondence in your recent number, that interest in this subject is being awakened.

I have not yet read Mr. Hyatt's book; but shall do so at an early opportunity. With reference to his remarks on horizontal cleavage, I may say that in my earlier practice I endeavoured to act on the "single-dump" principle, having read that it was the correct thing: but I found I could not get the work done that way; as it really is not practicable to make a good finish in one heat. A contractor whose cement concrete work bears an exceptionally high reputation, and who has laid many miles of street pavement and railway platforms, and who invariably forms his pavement in two layers, assures me that when, through the upward bending (due to the earth's contraction and expansion), cracks occur, as they sometimes, but rarely, do, these cracks are invariably clean, square-edged fractures, exhibiting no shelliness, nor the slightest indication of horizontal cleavage between the layers. My own very extended observation of pavement cracks confirms this testimony; and I have seen no instance supporting the theory that bending stress causes horizontal cleavage.

Doubtless, as Mr. Mark Fawcett says, terra-cotta is a more fireproof material than cement-concrete. But the expensiveness of the method of construction proposed by Mr. Fawcett renders it inapplicable to ordinary dwelling-houses and cottages.

Moreover, when terra-cotta flooring is employed, there is no need for any cement-concrete at all. The admirable terra-cotta flooring of Messrs. Doulton is specially designed to protect girders, and to afford a key for plaster ceiling. It combines great lightness and strength with fireproofness. But though Messrs. Doulton have reduced the cost to a very reasonable figure, this kind of fireproof-flooring cannot be produced so cheaply as ordinary timber floors, while cement-concrete slabs *can*.

Dwellings erected with cement-concrete slab floors, if a fire occurs, cannot well be subject to a heat sufficiently fierce and prolonged to destroy the virtue of the concrete. If the building were stocked with oil-casks and tar-barrels, the case might be different.

There is no material *absolutely* fireproof, and, as practical men, architects ought not to discard the security to life from fire which concrete slabs undoubtedly afford, and persist in building wooden roofs and floors, because some absolutely fireproof material, cheap enough for common use, is not yet discovered. For even if the basement of a man's house were stocked with tar-barrels, and the man were aroused at midnight by the cry of "Fire!" he would feel devoutly thankful if the floors of his house were of cement-concrete slabs instead of timber.

Two fires occurred in a large warehouse, with floors of concrete slabs, which I designed. One of these fires raged for a considerable time, but succeeded only in destroying some wood partitioning. The other fire destroyed thousands of pounds of tea, but only the wood shelving suffered. Either of these fires would, probably, have caused the destruction of the entire property had the floors not been fireproof. As it was, the structural damage of both fires did not reach 50*l.* Those floors are still bearing huge loads; they have not suffered in the least from the fire. This may be taken as a fair instance of the value of concrete slabs.

Mr. Fawcett speaks of some floors of concrete which collapsed without giving a moment's warning. It would be interesting if date and place were specified. Doubtless such things have happened, with concrete walls as well as floors. So also have spires collapsed,—Chichester Cathedral steeple, to wit. Still we go on building spires. A few years ago a whole row of houses and shops (built of brick, iron, and timber), in Seven Sisters-road, Holloway, fell down. Still we go on building rows of houses and shops of brick, iron, and timber. Cement-concrete slabs cannot collapse if properly constructed of good material, any more than steeples and houses can fall if well built.

The reply to "Architect's" query is, Yes, certainly; equally distributed.

FRANK CAWS.

SIR,—Mr. Frank Caws's contribution to our present knowledge of concrete construction contains much information which should be of service in extending the use of concrete as a sanitary and fire-resisting material, but his remark that it would be well if others would publish their experience of concrete has as yet not been responded to, except in a brief communication from Mr. Hyatt. This is undoubtedly the result of concrete floor construction being to a great extent in the hands of specialists and patentees, whose interests do not lie in the direction of imparting to the public knowledge gained by themselves at considerable cost and time, without any equivalent but the consciousness that they have helped in bringing about a better acquaintance with one great element of healthfulness and personal safety. Architects are disposed to entrust the construction of concrete floors to well-known and experienced firms who make that subject a specialty, because they can thereby depend upon a proper knowledge being brought to bear upon the execution of their work, and which is not, as yet, common to builders and contractors. When the time arrives for wood floors in populous centres to be as rigidly prohibited as wood walls are now, and the fact is recognised that the two are but one step removed from each other in point of danger, concrete floor construction will become an essential of a builder's business. Mr. Caws' remarks upon the necessity of using stale cement are of the greatest importance; but instead of relying upon manufacturers to store it ready for use, it is far safer for the user to store it himself on a wood floor, and well protected from damp in any form. The remarks as to the too quick removal of the centreing supporting concrete floors cannot be too well impressed on every one concerned. The falls of concrete floors at Portsmouth, Faversham, and Cambridge some years ago, were all traceable to the too early removal of the centres; a mass of concrete which, on the surface, may appear thoroughly consolidated and capable of sustaining any ordinary superincumbent weight, will, if cut into, often be found gradually looser and softer until the centre is reached, when probably it may be removed by hand; the better, too, the work has been performed, the longer it takes to harden, because the more effectually has the air been excluded. Concrete taken from the inside of a wall 4 ft. thick, after having been deposited in place nearly a fortnight, could be readily crumbled apart; specimens which were exposed to the air fairly well stood the blows of a sledge hammer a month later. Mr. Caws' calculation that one of cement to four of aggregate will form a concrete two-fifths of the strength of neat cement is a conditional one, for very much depends upon the nature of the aggregate, the proportions of size, the way in which the concrete has been mixed and applied, and generally, indeed, upon the common sense employed in its application.

I do not think the practice of depositing the concrete for floors in three thicknesses will meet with general approval. My own experience is that the quicker any concrete mass can be deposited in place, and the nearer the whole approaches to monolithic construction, the stronger it is; the

* Equal to carbonate of lime.

intervention of a slab of concrete between two others—one in compression, the other in tension, and with little connexion or bond between them, requires, I suggest, some corroborative testimony as to its advantages.

With regard to a portion of the cement being carried through and away by the water used in mixing the concrete, I have always found that if only a moderate quantity of water is employed, no cement passes through the concrete; but the water not required for hydration may be caught in a vessel, and will be found perfectly colourless, and if the floor slab is cut through a section of the same will show the cement to be equally distributed throughout.

If the floor support is made water-tight, the result of gentle impingement of the concrete to produce homogeneity is to bring the superfluous water to the surface, which, after a short time, disappears, and assumedly is distributed throughout the mass, so that the streams of motion mentioned by Mr. Caws are increased by making the centreing or staging water-tight, as the water rises to the surface and eventually sinks again, occupying much more time than if allowed to pass through spaces left between the centreing-boards for the purpose. Mr. Caws speaks of the expansion of concrete as an ascertained result, but with stale cement I have never found this expansion. A concrete floor, 100 ft. in length, resting on iron girders, with one division-wall only upon it, and commenced and finished within a week, therefore practically free to expand or contract, and made ten years ago, has during that time not changed in form sufficiently to disturb one mortar-joint of the bricks walls supporting it. Had expansion happened the end-walls must have given evidence thereof; but, although examined at various times, they were always found to be perpendicular.

The only change of form I have observed is that of slight contraction, the result being the skin cracks alluded to by Mr. Cawn, but change of temperature undoubtedly exercises considerable influence on concrete, extreme cold causing it to shrink perceptibly, as evidenced by the fissures to be found in concrete pavings in winter, but which close in summer. This points to the advisability of doing concrete paving in cold weather. Indeed, the result is so apparent that I always postpone the execution of monolithic pavements until winter if practicable, keeping them sheltered for a time with straw, old sacks, &c. Floors of concrete being protected by walls and roofs, are not so subject to change of temperature, and therefore less liable to change of form.

Mr. Caws remarks upon the great difference, in a weight-carrying sense, of a concrete floor slab supported on four sides, and if as a beam, on its ends only, and the additional strength gained if the four edges are fastened, pinned, or weighted down. This is so important a feature that I invariably construct the floor when the walls are the height to receive it, and build the continuation of the walls on the floor, the latter is thus a slab binding the walls of the building together, and becomes of the nature of a cantilever, so much so indeed that I have ascertained that one 10 ft. between supports may be cut assunder midway, and uphold itself and a good load as well, and probably much greater spans could be treated in a similar way. The use of concrete with as small an amount of iron as possible, as suggested by Mr. Caws, is in a general way, I believe, a correct and economical method of construction, and with the cheapening of cement, and its great increase of strength, we only want reliable data to enable concrete floors to compete with wood in the way of cost. In blocks of farm buildings I have found it practicable to do this for years past; this being so, there seems no reason why it is not equally as practicable to adopt it for dwelling-houses in towns; only one factor intervenes—prejudice.

Alresford. THOMAS POTTER.

The Sanitation of Stockholm. — The report of the Board of Health of Stockholm for 1888, just issued, contains an interesting account of the analysis effected last year by Dr. Claes Sondén upon the state of the water in the Lake Mälar, by Stockholm, whence the water-supply of the city is obtained, and the end connected with the sea into which the sewage is discharged. The report goes to show that the sewage in no way affects the purity of the drinking-water, the two spots of inflow and outflow being miles apart. The water carried out to sea with the sewage is shown to contain only 2·3 to 3 milligrammes of solid matter per litre, which if water-closets were adopted in the city would, it is estimated, increase to 4 milligrammes. In Stockholm earth-closets are almost entirely used.

The Crematoriums of Europe.—There are now thirty-nine crematoriums at work in Europe, of which no fewer than twenty-three are situated in Italy, where, to the end of last year, 1,177 bodies had been cremated, as against 1,269 in the rest of Europe.

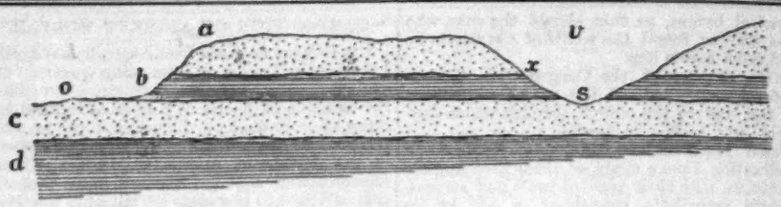


Fig. 1.

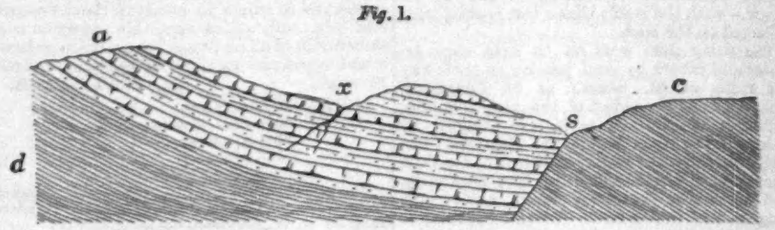


Fig. 2.

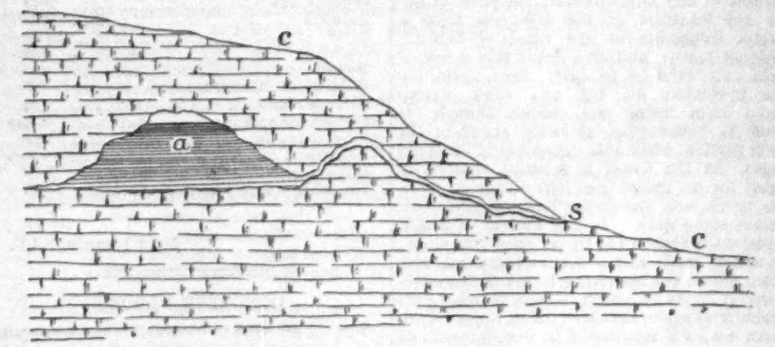


Fig. 3.

The Student's Column.

WATER-SUPPLY.—VIII.

SPRINGS.

SPRINGS are bodies of water issuing to the surface from an underground source. They may be caused either by hydrostatic pressure or by continuous descent, from the level on which it fell as rain and percolated, to the point of outflow. We give the annexed diagrams to explain a few features of the phenomena accompanying them.

In fig. 1 the sandy bed, *a*, rests on an impermeable clay *b*, and the water percolating through *a* soaks to the surface of *b* and then flows down it to the point *x* where it issues as springs, perhaps here and there along the line of junction. The bed, *c*, also sandy and resting on the clay, *d*, is water laden derived from its outcrop *o*. It is cut into by the valley, *v*, which taps the supply forming springs at *s*.

In fig. 2, the water-bearing bed, *a*, resting on an impervious clay, *d*, throws out a spring at *x* through a joint, and the whole formation is faulted against a clay, *c*, causing another spring at *s*.

In many instances we know that springs do not give out the same quantity of water all the year round. Various reasons may be assigned to account for this, but, generally speaking, it may be affirmed that it is either directly or indirectly due to the variability of rainfall. This being the case, we should expect all such springs to approximately indicate rainfall periods, by the increase in their volume, and so they do, excepting, perhaps, some intermittent ones, which behave rather eccentrically. Many of these latter are observed to run periodically and occur mostly in limestone districts. The river Mole, in Surrey, is a good example of this kind of spring. It appears abruptly at intervals which are nearly regular, runs powerfully for some time, and then suddenly stops. It is conceded that all this is due to rainfall, but the fact remains that a great deal of rain may be received by the chalk on the North Downs—its source—before this spring begins to run, and the question is, Why does it not begin to run *immediately* after the chalk has imbibed a *portion* of this rainfall? Other springs do; and, why does this one wait so long before commencing to yield? The mystery may be explained by fig. 3, in which *c* represents chalk; *a*, a cavern in the chalk having an upward curved passage subsequently leading down to the opening *s*.

The chalk absorbing the rain, gradually fills the cavern with water, and so long as the water-level is *not* higher than the top of the curved channel the water cannot escape, but immediately it *is* higher the channel acts as a siphon, and, having once commenced, the water continues to run until the whole reservoir, *a*, is emptied.

Rivers sometimes run in valleys which were formed in part by faults, and inasmuch as these dislocations of the strata frequently throw out springs (see fig. 2), it is not difficult to understand why such rivers are augmented in volume at various points along their course without the assistance of tributaries. Springs do exist in the beds of rivers, however, without the presence of faults; it may happen that any of the kind of springs alluded to in figs. 1, 2, and 3, may issue by accident at certain points in the river-bed, or, indeed, they may have had a prominent share in creating the river. The Thames is considerably increased in volume in this way.

The flow of springs and the output of wells are occasionally augmented by earthquake action. This fact was exemplified by the East Anglian earthquake of April 22, 1884, when the water-levels in two wells at the Colchester Waterworks, and many others in the vicinity, rose far above their normal heights,—a fortunate circumstance,—as an increased supply at that time was urgently needed. In the majority of instances we find that when the level is raised from this cause it is not permanent. It is true that for a few weeks, or months, the supply may be largely increased, but after rising to an abnormal height it is almost certain to fall very considerably before becoming anything like permanent again. The cause of this is that earthquakes widen fissures and joints in the rock, whilst they also create new cracks, which admit of the underground water circulating more freely. After a time these cracks may partially, or wholly, close to their original size, when normal conditions again prevail. In the event of the fissures becoming permanently enlarged, the permanent increase in supply, either of springs or wells, would, naturally, largely depend on the amount of water supplied by rain or otherwise to the rocks in question.

Even where the supply is permanently aug-

mented, it may not be an unmixed blessing, especially in volcanic districts, by reason of the introduction of some obnoxious mineral matter rendering the water undrinkable. It may, however, henceforth become useful for medicinal purposes; but we do not propose to deal with mineral springs.

PROVINCIAL NEWS.

North Shields.—The other day, Earl Percy opened the Tynemouth Jubilee Infirmary, North Shields. According to the *Newcastle Chronicle*, the original design for the building contemplated a central or administrative block with east and west wings (for females and males respectively), but the present arrangement for accommodation of patients did not appear to warrant the carrying out of more than the west wing, the northern half of which has been allocated to females, and the southern half to males. In like manner the tower, which was intended to form the central feature of the administrative block, has been for the present omitted. On the east side of the entrance is a board-room, 16 ft. by 14 ft., and on the west the matron's sitting-room. At the opposite side of the corridor to the matron's room is the bath-room, 12 ft. 6 in. by 9 ft., and a large linen store closet. Beyond the side of the stairs northwards is the double door of the surgeons' department. This opens into the operating-room, 16 ft. by 14 ft., lighted from the top as well as the sides. This room, in addition to an ordinary fireplace, has a separate coil of pipes, so that it is always sufficiently warmed in case of accidents being brought in; also a drug store communicating with it, containing a closet for medicines and instruments, and the necessary supply of hot and cold water. At the north-east part of the centre block is placed the kitchen, 16 ft. by 15 ft., fitted with a Thorncliffe cooking-range. In connexion with this is a scullery, 12 ft. by 11 ft., with separate range, &c., and on the east side of the kitchen is the pantry and larder, the latter being fitted with slate shelves. The wash-house adjoins the scullery. The east and west corridor has a total length of 104 ft., with windows at the ends and also at the sides, where it is a connecting link between the administrative block and the wards, which are 28 ft. apart. In it are two sets of folding doors, and the whole length is heated by hot-pipes. The corridor is branched off north and south about 25 ft. from the west end forming the entrance to the female and male wards respectively, and at this intersection four rooms are placed, two being for the use of the nurses, the one as a duty-room with small range and gas-heating apparatus for night service, with a window looking into male ward, and provided with hot and cold water, and the other nurses' room with a similar window commanding a view of the female ward. The remaining two rooms are intended for isolation wards in case of infectious complaints rendering it desirable to remove patients from contact with others in the main wards, or in the treatment of children. These wards are each 12 ft. by 11 ft. The male ward is 32 ft. by 24 ft., 13 ft. high, and contains eight beds, giving 96 superficial feet to each bed, or 1,248 cubic feet per bed. At the south end of this ward is an open fire with ventilating grate, for the purpose of distributing heated fresh air in winter and cold in summer. Behind the fire is a very large bay window, fitted all round with seats. Access to this is obtained from the ward by a door on each side of the fireplace, and the hot pipes placed all round the side walls of the ward are continued round the bay. The female ward contains six beds, and is 26 ft. by 24 ft., with separate conveniences placed externally to the ward at the north end. In all other points the wards are similarly arranged. Windows are placed between each bed. The lower part has double-hung sashes with a hinged upper part falling into an iron hopper frame. The bricks used are 2½ in. thick, of a red colour, red brick arches to all openings, and the foundation walls up to ground level are of cement concrete. The roofs are covered with green Cumberland slates. Particular attention appears to have been paid to the sanitary requirements. The contractors for the whole of the works are Messrs. J. & W. Simpson, of North Shields and Blyth; the subcontractors being Messrs. Beck, of Newcastle, for slating; Messrs. Grieve & Gillispie, of North Shields, for the plumbing and gas-fitting; and Mr. J. G. Laidler, of Newcastle, for painters' and glaziers' work. The architect is Mr. F. R. N. Haswell, F.R.I.B.A., of North Shields, and under his superintendence the whole of the work has been carried out.

Northampton.—On the 1st inst., amid considerable enthusiasm, the Mayor of Northampton, Mr. James Barry, J.P., formally laid the commemoration-stone of the extensions of the Guildhall. The present municipal buildings were built in 1864, from the designs of the late Mr. E. W. Godwin. Since their erection Northampton has doubled in population. The extensions, which were designed jointly by Mr. Matthew Holding, of Northampton, and Mr. A. W. Jeffery, of Hastings, include a new Council chamber, a police-station, cells, and parade-ground, a mortuary, and numerous offices. Exclusive of the site, the buildings will cost 25,000*l*. In elevation the new building will match the existing Town-hall. Mr. H. Willcock, of Wolverhampton, is the builder.

VARIORUM.

"The Railway and Commercial Gazetteer of England, Scotland, and Wales" (London: McCorquodale & Co., Limited, and W. J. Adams & Co.), is the eleventh edition of an exceedingly useful work of reference. It has been compiled from official sources, and purports to contain a complete list, arranged in alphabetical order, of every railway-station, town, village, hamlet, parish, and place in Great Britain,—its locality, population, distance from London, line of rail, nearest railway-station (when the place named is not that of a station), and distance from station — places having post-offices, money-order-offices, and telegraph-offices being distinguished, as are the "through-rate" routes for merchandise, passengers, and parcels to, from, or through London and all parts of the kingdom by the various railways, together with particulars of their arrangements and facilities for shipping goods at the principal ports for all parts of the world. No pains seem to have been spared to make the work as complete as possible in every detail. It includes upwards of 40,000 place-names, and when it is remembered that there are many towns and places of the same or nearly the same name (for example, we find that there are upwards of 180 "Newtons," situated in about fifty different counties, and fifty "Uptons," in about twenty-five different counties), we shall be justified in saying that this work will become indispensable in all large offices and places of business, a reference to it enabling one to identify and locate any particular place.——Messrs. J. & A. Churchill inform us that they hope to publish in September an important work on Fuel and its Applications, by Mr. E. J. Mills, F.R.S., and Mr. F. J. Rowan. It will be the first volume of a large work on Chemical Technology, of which Mr. C. E. Groves, F.R.S., will be the general editor, and which will be founded on one written by Richardson and Ronalds, familiarly known as "Knapp's Technology." Messrs. Mills and Rowan's work on fuel, we understand, is in reality a new work, in which the applications of fuel to arts and manufactures, as introduced by the most modern discoveries, are given to the scientific world. The volume will be profusely illustrated.

RECENT PATENTS.

ABSTRACTS OF SPECIFICATIONS.

13,155, Roof Gutters. W. Joynson.

According to this invention, leakage from the roof is prevented, and water rapidly carried off, by forming the gutter of earthenware with turned or rebated joints, and bedding the gutter in cement or similar plastic material. Another method is specified in which these earthenware gutters are used in conjunction with moulded brick to form cornices. In yet another method the roof is constructed with a "drainage surface" composed of layers of cement and slate, affixed with mortar, and used with or without felt, &c.

13,259, Mosaic Work in Crystalline Glass or other Vitreous Substances. W. R. Pullen.

This invention provides for the use and application of what is known as "crystalline" or "crystallised" glass, either white or coloured, and backed with gold, silver, or any other material which will produce a varied or iridescent effect in combination with ordinary gilded, silvered, or painted glass, or any vitreous substance, with ornamentation painted and fired on the surface, or otherwise cut into regular and irregular shapes and sizes, marked in such manner as to produce mosaic ornamentation for ecclesiastical or domestic purposes, the same being backed with cement, glass, or slate, or their equivalent, the ornamentation being thus hermetically sealed against the atmosphere.

14,175, Tools for Working Stone, Slate, Marble, &c. L. Pichery.

This invention relates to a revolving tool carrying a sufficient number of cutters of suitable shape adapted for cutting and dressing stone, slate, or marble, especially of an irregular degree of hardness, such as "schistose" slate, in which very hard sulphurets are found. Provision is made for the ready removal of the cutters, whilst they are also firmly held with but little flexibility or spring.

14,847, Attachment for fire-places. T. Redmayne.

According to this invention, an iron apparatus, similar to a "coal-saver" is affixed to the front of the grate in order to economise fuel.

17,750, Reversible sliding sash-windows. J. Carpenter.

In this invention the sashes are made to turn down inside the apartment, one over the other, in the following manner:—The inside beads being fitted with screws, which work into slotted plates, with the exception of a 6 in. piece or so at the top, which turns inwards, allowing sufficient space for the remaining beads to be raised out of the slots. The lower sash is likewise raised to a certain distance from the cill, a spring being fixed at the bottom ends of the stile. This spring has a special pivot, which, while in a vertical position only enters a slot fixed in the pulley-stile, the sash being free to move up and down in the ordinary way. A small portion of the outside of the stile, above where the cord is fixed, is cut away to allow it free action. The cords are attached to the sash, through holes made in metal plates fixed to the stiles, which allow the sash to turn inward till it rests on the inside nosing of the cill in almost a vertical position, the weights balancing the sash to allow this to be done with ease and safety. Then a necessary portion of the parting-bead or slip is cut out and fitted with pivots and made to turn into the pulley-stile. The top sash is also fitted with a spring, fixed to the horns or corners. The cords are also adjusted and fixed as in the bottom sash, and a portion of the stile also cut away. The sash is then lowered to the slot and pulled inward until it rests flat on the bottom sash, thus affording from the inside greater facility, simplicity, and safety in cleaning, painting, &c.

NEW APPLICATIONS FOR PATENTS.

Aug. 6.—12,386, F. Robinson and E. Hodgson, Imitation Tiled Hearths.—12,397, H. Owens, Opening, Closing, and Securing Movable Casements, &c.—12,417, C. Rogers, Wood Screws.—12,454, J. Turnpenney, Flushing Tanks or Cisterns.—12,457, W. Bunting, jun., Water Closets.—12,459, J. Mulligan and C. Swindell, Chimney or Ventilating Caps.—12,483, R. Thompson, Flushing Cisterns for Water Closets, &c.—12,499, L. Coombs, Automatic Cupboard Latch.—12,501, J. Darby, Joints for Pipes.

Aug. 8.—12,526, A. Patrick, Manufacture of Bricks.—12,550, M. Dickens, Road Paving.—12,559, J. Bristow, Repairing Slated Roofs.

Aug. 9.—12,578, S. Coales, Door Locks and Latches.—12,620, T. Charteris, Wood-block Flooring.

Aug. 10.—12,623, T. Shaw, Utilising the Waste Product from Sewage Works for Building Purposes, &c.—12,665, R. Haddan, Waterproof Covering for Walls, &c.—12,672, S. Chandler, Chimney Tops.

PROVISIONAL SPECIFICATIONS ACCEPTED.

9,983, C. Glanville and W. Williamson, Fan for Chimney Cowls and Ventilators.—11,123, G. Batchelor, Drying Slurry by the Waste Heat from Cement Kilns.—11,239, F. Taylor, Nails or Fasteners.—11,630, J. Ash, Latches and Locks.

COMPLETE SPECIFICATIONS ACCEPTED.

Open to Opposition for Two Months.

12,729, G. Böklen, Metallic Roofing.—13,158, J. Lawson, Heating Buildings.—14,734, B. Russell, Air Inlet Ventilator.—16,687, J. Burn, Sash Fastener.—10,858, E. Baldwin, Paint for Wood, &c.—10,902, J. Tonge, Chimney and Ventilating Shaft Tops.—11,117, J. Fryer, Extracting Cowl or Ventilator.

The Sarcophagus of the Emperor William I.—Professor Erdmann Encke has completed his design for the double sarcophagus of the Emperor William I. and his surviving consort, the Empress Augusta, which has been approved by the present Emperor. The two sarcophagi are of marble, between them standing the angel of resurrection, stretching the right hand over the sarcophagus of the Emperor as if bidding him to arise, whilst in the left it holds the bassoon of the day of judgment. Contrary to usage, the lids do not bear the portaits of the persons they enclose, that of the Emperor having the Imperial ermine, the sword of state, and the sceptre carved upon it, surmounted by the Crown, whilst that of the Empress is equally suitably ornamented. The entire composition is to be executed in life-size. The sarcophagus is to be erected in an annexe of the Charlottenburg Museum.

RECENT SALES OF PROPERTY:

ESTATE EXCHANGE REPORT.

Aug. 7.—By W. W. Jenkinson (at Henley).
Henley-on-Thames—Four plots of f. land £288

Aug. 12.—By Green & Son (at Clacton-on-Sea).
Clacton-on-Sea—An enclosure of f. land, about 10 acres 720
An enclosure adjoining, 6a. 1r. 32p., f. 900

By Langridge & Freeman.
Hadlow, Kent—"The Bourne Estate," 196a. 3r. 4p., f. 4,440

By C. & F. Rutley.
Caterham, High-st.—Two plots of f. land 610
Upper Caterham—An enclosure of f. land, 4a. 0r. 30p. 480
Two enclosures of f. land, 5a. 1r. 20p 650

By P. Hodson.
Stroud Green—62 and 64, Ferme Park-rd., u.t. 89 yrs., g.r. £20. 10s., r. £111 p.a 1,310

By Green & Son (of Hammersmith).
Tottenham—19 to 22, Evelyn-rd., u.t. 98 yrs., g.r. £12, r. £78 p.a. 620
West Kensington—36, Westwick-gardens, f., o.r. £50 p.a. 530
34, Westwick-gardens, f., o.r. £35 p.a. 290

Aug. 13.—By Wood & Kirby.
Tottenham—1 to 11 (odd), Vicarage-rd., u.t. 98 yrs., g.r. £38 975

By Sinclair & Son.
Kingsland—46 to 54 (even), St. Jude-st., f., r. £111 1,350
58, St. Jude-st., f., r. £40 p.a. 655
Hoxton—5, Whitmore-rd., u.t. 31 yrs., g.r. £2. 5s., r. £36 295

By Ward & Clarke.
Surbiton—9 to 12, Woodside, f., r. £120 p.a. 1,100
5 to 8, Woodside, f., r. £130 p.a. 1,115
F.g.r. of £20, secured upon 1 to 4, Woodside 450

By Debenham, Tewson, & Co.
Weston-in-Arden, Warwickshire—"Weston Lawn Farm" and 171a. 2r. 17p., f., r. £173 p.a. 3,200

By Wilkinson, Son, & Welch (at Brighton).
Brighton—43, Goldstone-rd., f. 350
Sussex, Findon—F. house, cottage, and 4a. 1r. 3p. 700
A plot of f. garden ground, 0a. 1r. 22p. 250
Nepcote Green—An enclosure of land, 10a. 2r. 0p. 170

Aug. 14.—By Cann & Co.
Dulwich—3, Crystal Palace-rd., u.t. 67 yrs., g.r. £4. 4s. 255
11 and 13, Ferris-rd., u.t. 87 yrs., g.r. £12. 12s., o.r. £54 465

By Hobson, Richards, & Co.
Islington—36, Compton-ter., u.t. 28 yrs., g.r. £10, r. £94 p.a. 595

By D. Smith, Son, & Oakley.
Haselmere—"Church Hill House" and 3a., f. 3,000

Aug. 15.—By Newbon & Harding.
Stoke Newington—2 and 4, Grazebrook-rd., u.t. 72 yrs., g.r. £9. 15s., r. £70 p.a. 700
Nos. 6 and 8, Grazebrook-rd., u.t. 72 yrs., g.r. £8, r. £76 p.a. 705
King's Cross—211 to 217 (odd), Caledonian-rd., u.t. 51 yrs., g.r., £32, r. £178 p.a. 1,480
221 to 225 (odd), Caledonian-rd., u.t. 51 years, g.r. £32, r. £180 p.a 1,490
227 and 227a, Caledonian-rd., u.t. 51 yrs., g.r. £8, r. £37. 12s. 460

Aug. 16.—By R. Reid.
Child's Hill—18, The Village and plot of land, f., r. £30. 16s. 475
Harrow-rd.—8 and 10, Hampden-st., u.t. 56 yrs., g.r., £10, r. £64 600

By A. & A. Field.
Stratford—30 to 40 (even), Mark-st., u.t. 79 yrs., g.r. £24 840
Bow—60 and 62, Knapp-rd., u.t. 73 yrs., g.r. £7 ... 330
Spitalfields—69, 71, and 73, Hanbury-st., u.t. 20 yrs., g.r. £35 400
80, 82, and 84, Hanbury-st., u.t. 10 yrs., g.r. £25 230
Bethnal-green—70, Hare-street, u.t. 5¼ yrs., g.r. £9. 15. 80

[*Contractions used in this list.*—F.g.r. for freehold ground-rent; l.g.r. for leasehold ground-rent; i.g.r. for improved ground-rent; g.r. for ground-rent; r. for rent; f. for freehold; c. for copyhold; l. for leasehold; e.r. for estimated rental; u.t. for unexpired term; p.a. for per annum; yrs. for years; st. for street; rd. for road; sq. for square; pl. for place; ter. for terrace; yd. for yard, &c.]

Miscellanea.

Architects as Masters of Companies.—On the 15th of this month Mr. Wyatt Papworth was elected Master of the Company of Clothworkers for the year ensuing. About a fortnight before, Mr. John T. Christopher, of Bloomsbury-square, was elected Master of the Company of Salters, and since then it is announced that Mr. Banister Fletcher was "sworn in as Master of the Company of Carpenters on the 13th inst." Of course of late years several architects have attained this dignity, as Mr. Charles Barry, Mr. Thomas Cundy, Mr. Charles J. Shoppee, and Mr. W. W. Pocock, but probably never before have three members of the profession been elected to such a post in one year,—almost in one month.

Florence.—The demolitions for the improvement of the centre of Florence that caused so much irritation amongst all lovers of art and taste in Italy and abroad (see *Builder*, Feb. 23, 1889), are being continued with great activity. The Loggia del Pesce, a building full of elegance and grace, erected by Vasari, has been pulled down, and in a short time the tower and palace of the Amieri will meet with the same fate.

The English Iron Trade.—The English iron market continues very steady, although prices have in some cases slightly given way. This has been the case with pig-iron in the north and north-west of England, the trifling decline being due to heavy sales by second-hand holders desirous of realising profits. The Glasgow warrant market has been comparatively steadier, while some Scotch makers quote higher prices still this week, No. 1 Coltness having reached 60s. In manufactured iron, trade is pretty fair, and the better rates recently obtained are tolerably well maintained. The steel-works are overflowing with orders, and some are so favourably situated with regard to work as to be able to fairly dictate terms. Shipbuilding is very active, and engineers continue as busy as ever.—*Iron.*

The Bath Stone Firms' Workmen's Benefit Club.—The general meeting of the Bath Stone Firms' Benefit Club was recently held at Box Hill Schoolroom. The report of the preceding year showed a balance in hand of 35*l.* 17s. The amount contributed by the members was 202*l.* 15s. 9d., and that expended in sick pay was 167*l.* 5s. 3d., there being a great amount of sickness during the year. The club has now 344 members. Mr. Sumsion was unanimously elected treasurer, and Mr. C. F. Spackman secretary.—*Bath and Cheltenham Gazette.*

The Sewage Question in Copenhagen.—The sewerage system of Copenhagen is very defective, and is giving great cause for complaint, the water and foreshore of the town being frequently in a most offensive state. The Municipality fully acknowledges this, and have under consideration a plan for the construction of three sewerage systems for the northern, southern, and central part of the town, by which the sewage will be carried right into the Sound, across the island of Amager; but the scheme is a very costly one, and cannot be carried out for some years.

Phœnix Philanthropic Society of Painters and Decorators:—(The Old Cave, enrolled 1827, and meeting at the "Spread Eagle," Mortimer-street, W.)—We are asked to announce that the annual dinner of the members and friends of this old-established society will take place at the Holborn Restaurant, on Saturday, the 31st inst., at 7 p.m. At the meeting of the members last week, a vote of condolence with the family of the late Mr. J. G. Crace (whose death was announced in our last) was carried unanimously.

The Swedish Woodwork Industry.—The Swedish export trade in woodwork for buildings is steadily increasing, the value of the articles exported last year being 95,000*l.*, as against 80,000*l.* in 1887. The chief ports of export are Gothenburg, with 70,000*l.*; and Stockholm, with 20,000*l.* The largest consumer is Great Britain, with 51,000*l.*, being followed by Holland, with 10,000*l.*; Prussia, 8,000*l.*; and France and Belgium with 2,000*l.* each, &c. The export to the Cape was 1,000*l.*, and to Australia 700*l.*

Building Materials in Tangier.—According to a recent report of the British Consul at Tangier, "The trade in building materials continues brisk, and large quantities of bricks, tiles, deals, and iron rafters have been imported to meet the demand. English cement is giving place to French, which is much cheaper, being sold here (including duty) at 12s. per cask of 450 lb., whereas English cement costs 14s. per cask of 400 lb., or 31¼ per cent. more. Some cement also comes from Germany."

Fatal Scaffold Accident.—It is reported that while five men were working on a scaffold 50 ft. high, at Spring Vale Works, Bilston, on Tuesday, the scaffold collapsed. Richard Colley, aged twenty, fell on his head and was killed on the spot, and Thomas Judson, thirty-four, died directly after his admission to the Wolverhampton hospital. Thomas Bennett was terribly injured, and is in a critical condition. Robert Colley sustained a broken ankle. The fifth man escaped uninjured.

"Rhinefield," Hants.—We are asked to say that the iron casements, gates, and other metal work in this building (illustrated in our last) are by Mr. Joseph H. Barford, of Maidenhead, not "J. Burford," as the name was incorrectly given last week.

New Harbour in Russia.—St. Petersburg journals state that the Minister of Public Works has decided upon constructing a large new harbour and docks at Windau, in Courland, at an estimated cost of 500,000*l.* This port would be open all the year round.

The Case of Presland *v.* Bingham.—In regard to this case, which involved a novel point in connexion with the law of light, and upon which we commented in a "Note" in our issue of the 20th ult., we are asked by the plaintiff to say that he made no complaint whatever regarding the height of the empty packing-cases, so far as the light was affected; they were thrown in an irregular heap, which was never of sufficient height to prevent free access of light to plaintiff's skylight. The obstruction complained of was a brick wall, erected to a height of 23 ft.

Extension of Antwerp Docks.—In consequence of the growing trade of Antwerp, the Municipality of that city has decided upon a further enlargement of the dock accommodation. It is now two years since the great docks Africa and America were opened, and, in order to connect them directly with the Scheldt, a wide canal is to be constructed, 100 mètres in length, whilst the quays along the river are to be further extended, when they will have a length of 4,500 mètres. The cost of the work is estimated at about 200,000*l.*, and will be borne by the city and the State in equal proportions.

The Armada Memorial, Plymouth.—The *Western Morning News* reports that at a meeting of the General Committee held at Plymouth, on the 16th inst., to determine as to the erection of the statues and relievos for the Armada memorial on the Hoe, the tender of Mr. W. Charles May, of the Studios, Penn House, Rudall-crescent, Hampstead, was unanimously accepted.

PRICES CURRENT OF MATERIALS.

	£.	s.	d.	£.	s.	d.
TIMBER.						
Greenheart, B.G. ..... ton	7	0	0	7	15	0
Teak, E.I. ..... load	12	0	0	14	0	0
Sequoia, U.S. ..... foot cube	0	2	3	0	3	0
Ash, Canada ..... load	3	10	0	5	0	0
Birch ,, ...	3	10	0	6	0	0
Elm ,, ...	4	0	0	5	0	0
Fir, Dantsic, &c.	2	0	0	3	10	0
Oak ,, ...	2	10	0	4	10	0
Canada	5	10	0	7	10	0
Pine, Canada red	3	0	0	4	0	0
yellow	3	10	0	5	5	0
Lath, Dantsic ..... fathom	4	10	0	5	10	0
St. Petersburg	5	0	0	6	10	0
Wainscot, Riga, &c. ..... log	2	15	0	4	5	0
Deals, Finland, 2nd and 1st ...std.	9	0	0	11	0	0
,, 4th and 3rd	7	0	0	8	15	0
Riga	7	0	0	9	0	0
St. Petersburg, 1st yellow	11	0	0	15	0	0
,, 2nd ,, ...	10	0	0	11	0	0
,, white	7	0	0	10	0	0
Swedish	8	0	0	10	0	0
White Sea	9	0	0	17	0	0
Canada, Pine, 1st	16	0	0	20	0	0
,, ,, 2nd	11	0	0	17	10	0
,, ,, 3rd, &c.	8	0	0	10	10	0
,, Spruce, 1st	9	0	0	11	0	0
,, ,, 3rd and 2nd	7	0	0	9	0	0
New Brunswick, &c.	6	10	0	8	10	0
Battens, all kinds	6	0	0	16	0	0
Flooring Boards, sq., 1 in., prepared, First	0	11	0	0	14	0
Second	0	8	0	0	10	0
Other qualities	0	5	6	0	7	0
Cedar, Cuba ..... foot	0	0	4½	0	0	5
Honduras, &c.	0	0	4½	0	0	4½
Mahogany, Cuba	0	0	4½	0	0	6½
St. Domingo, cargo average	0	0	4½	0	0	6½
Mexican ,, ...	0	0	4½	0	0	5½
Tobasco ,, ...	0	0	5½	0	0	6½
Honduras ,, ...	0	0	5½	0	0	6½
Box, Turkey ..... ton	4	0	0	13	0	0
Rose, Rio	15	0	0	30	0	0
Bahia	14	0	0	18	0	0
Satin, St. Domingo ..... foot	0	0	6	0	1	0
Porto Rico	0	0	9	0	1	3
Walnut, Italian	0	0	4½	0	0	6½
METALS.						
IRON—						
Pig, in Scotland ..... ton	45	11	0	0	0	0
Bar, Welsh, in London	6	5	0	6	10	0
,, ,, at works in Wales ...	4	15	0	5	0	0
,, Staffordshire, in London ...	5	10	0	6	10	0
COPPER—						
British, cake and ingot ..... ton	47	10	0	0	0	0
Best selected	48	10	0	0	0	0
Sheets, strong	56	0	0	0	0	0
Chili, bars	43	10	0	0	0	0
YELLOW METAL ..... lb.	0	0	5	0	0	5½
LEAD—						
Pig, Spanish ..... ton	12	12	6	12	13	9
English, com. brands	12	17	6	0	0	0
TIN—						
Straits ..... ton	90	0	0	0	0	0
Australian	90	0	0	0	0	0
English Ingots	94	0	0	0	0	0
ZINC—English sheet ..... ton	21	0	0	22	0	0
OILS.						
Linseed ..... ton	21	7	6	21	15	0
Cocoanut, Cochin	26	15	0	27	10	0
Ceylon	23	10	0	0	0	0
Palm, Lagos	25	0	0	25	10	0
Rapeseed, English pale	31	0	0	0	0	0
,, brown	29	15	0	0	0	0
Cottonseed, refined	27	0	0	28	0	0
Tallow and Oleine	31	0	0	40	0	0
Lubricating, U.S.	5	0	0	0	0	0
,, refined	7	0	0	12	0	0
TAR—Stockholm ..... barrel	1	4	3	1	4	6
Archangel	0	13	9	0	16	0

COMPETITION, CONTRACTS, & PUBLIC APPOINTMENT.

Epitome of Advertisements in this Number.

COMPETITION.

Nature of Work.	By whom Required.	Premium.	Designs to be delivered.	Page.
New Town Hall	Yeovil Corporation	10 Guineas	Sept. 29th	ii.

CONTRACTS.

Nature of Work, or Materials.	By whom Required.	Architect, Surveyor, or Engineer.	Tenders to be delivered.	Page.
Painting Works	Croydon Union	F. West	Aug. 28th	xiv.
Wrought-Iron Fencing	Whitefield Local Board	T. Thorp	Aug. 27th	ii.
Maltings, Foreman's Cottage, &c., Worksop	Wm. Stoner, Esq.	E. W. Farebrother	Sept. 2nd	ii.
Painting and Repairs	City of London Union	*Official*	do.	ii.
Broken Granite	Barnet Local Board	do.	do.	xiv.
Drainage, &c., Works	Poplar Union	Clarkson	Sept. 4th	xiv.
Broken Granite and Flints	County of Sussex	C. Adcock	Sept. 6th	xiv.
Making-up Roads and Laying Tar-paving	Walthamstow Loc. Bd.	*Official*	do.	xiv.
New Post Office, Wimbledon	Com. of H.M. Works	do.	do.	ii.
Stoneware Pipe Sewer, &c.	Ware R.S.A.	Russell Austin	Sept. 9th	ii.
New Schools	Fenny Stratford Sch. Bd.	W. Hall	Sept. 14th	ii.
Sewerage Works	Teddington Local Board	H. York	Sept. 16th	ii.
Superstructure of Lunatic Asylum	London County Council	G. T. Hine	Sept. 24th	xiv.
Enlargement of Lunatic Asylum, Coulsdon	do.	C. H. Howell	Sept. 30th	xiv.

PUBLIC APPOINTMENT.

Nature of Appointment.	By whom Advertised.	Salary.	Applications to be in.	Page.
Clerk of the Works	Shirley, &c., Local Bd.	2*l.* 10*s.*	Aug. 29th	xviii.

TENDERS.

[Communications for insertion under this heading must reach us *not later than* 12 *Noon on Thursdays.*]

ALTHORNE (Essex).—For the restoration of, and repairs to, the tower of the Church of St. Andrew at Althorne, Essex. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London:—

Chas. Read	£330 0 0

ASHTON-UNDER-LYNE.—For alterations to the "Travellers' Call" Inn, Portland-street. Mr. J. H. Burton, architect, Warrington-street, Ashton-under-Lyne:—

J. W. Williamson, Ashton-under-Lyne	£128 0 0
Jno. Robinson, Ashton-under-Lyne	119 10 0
R. H. Sooth, Stalybridge	116 0 0
Thos. Dean, Ashton-under-Lyne	116 0 0
H. Gardner, Ashton-under-Lyne	115 5 0
Allen Holmes, Ashton-under-Lyne*	113 17 6
J. Cropper, Ashton-under-Lyne	108 0 0

* Accepted.

CHESHUNT.—For additions, &c., to Fairley farm-house, Goff's Oak, Cheshunt, Herts, for Mr. G. Orgler. Mr. J. G. Needham, architect, 11, Powerscroft-road, Lower Clapton, N.E.:—

H. S. Hawkings, Mile-end	£1,228 0 0
J. Bunce, Cheshunt	1,050 0 0
C. & R. Archer, Cheshunt	1,029 0 0
H. Winkley, West-green, N.	940 0 0
F. Sanders, Cheshunt	979 0 0

COLCHESTER.—For repairs and painting at the Union Workhouse, for the Colchester Board of Guardians. Mr. J. W. Starr, architect, Cups-chambers, Colchester:—

	Repairs.	Painting.	Total.
W. A. Chambers	£334 0	—	—
W. Rogers	235 0	£70 0*	£305 0
J. Rice	286 16	—	—
F. Dupont	275 0	—	—
R. Beaumont	178 10*	90 0	268 10
E. Baker	—	76 0	—
G. Northover	—	75 0	—
A. E. Cole	—	71 15	—
C. Mills	—	60 10	—
J. Bennell	—	61 10	—
H. P. Lewis	—	55 10	—
H. W. Peck	—	48 0	—

* Accepted, Rogers for painting and Beaumont for repairs.

COLCHESTER.—For erecting new factory, Stanwell-street, Colchester, for Mr. John Kavanagh. Mr. J. F. Goodey, architect:—

		Additional story.	Total.
Chambers	£4,897	£690	£5,587
Dupont	4 935	600	5,535
Everett	4,749	648	5,397
Dist	4,500	600	5,100
Dobson	4,498	600	5,098

ECTON (Northamptonshire).—For alterations and additions to Ecton Hall, Northamptonshire, for Major-General Sotheby. Messrs. Everard & Pick, architects, Leicester:—

T. & H. Herbert, Leicester	£2,861 0 0
Green Bros., Northampton	2,767 0 0
Parnell & Son, Rugby (accepted)	2,748 8 0

ENDERBY.—For new Club Room, "New Inn," Enderby, near Leicester, for Messrs. Everard, Son, & Weldon. Messrs. Everard & Pick, architects, Leicester:—

N. Elliott, Leicester	£190 7 0
Thos. Mason, Leicester	188 0 0
Morby & Cliff, Enderby	182 11 7
Phipps & Geary, Enderby (accepted)	180 5 9

EXNING (Suffolk).—For building four cottages at Exning, Suffolk, for Mr. M. Webb. Mr. Jno. Flatman, architect, Newmarket:—

Kerridge & Shaw,* Cambridge	£561 0 0

[Six tenders submitted.]

* Accepted.

EXNING (Suffolk).—For building new infants' school at Exning, Suffolk. Mr. Jno. Flatman, architect, Newmarket:—

Richard Arber	£855 0 0
Holland & Kent	650 0 0
W. P. Fuller	643 0 0
Simpson & Son	625 0 0
Kerridge & Shaw	620 0 0
H. J. Linzell	589 0 0
Saint & Son,* St. Ives, Hunts	580 0 0
Cowell & Son (withdrawn)	458 0 0

* Accepted.

HACKNEY.—For the erection of the Mission Church of the Good Shepherd (in connection with St. Philip's, Dalston), in Wilman-grove, London-fields, for the building committee. Mr. W. G. Shoebridge, architect, 158, Strand, W.C.:—

J. H. Mollett	£676 0 0
J. Anley	597 0 0
White & Co.	591 0 0
J. Walker	579 0 0
Turtle & Appleton (accepted)	578 0 0

HARROW.—For pulling down and rebuilding premises at Wealdstone, for Mr. G. Fox:—

Gullett Bros (accepted)	£550 0 0

HORLEY (Surrey).—For the erection of banking premises at corner of High-street, Horley, for Messrs. G. & G. S. Head. Messrs. E. & C. H. Burstow, architects, Horsham and Horley:—

R. Jennings, Charlesfield, Horley	£1,220 0 0
J. Brown, Lumley-road, Horley	1,196 0 0
W. Pledge, East Grinstead*	997 0 0

* Accepted.

HORSHAM.—For repairs and painting, &c., to the East Parade and Trafalgar-road Schools, for the Horsham School Board. Messrs. E. & C. H. Burstow, architects and surveyors, Horsham and Horley:—

H. Murrell, Horsham	£191 10 0
Aldridge Bros., West-street, Horsham (accepted)	184 0 0
J. R. Nightingale, Carfax, Horsham*	138 0 0

* Withdrawn, through mistaken calculation.

LEICESTER.—For erecting new schools, Clarendon Park, Knighton, Leicester. Messrs. Everard & Pick, architects, Leicester:—

Mason, Kibworth	£3,778 19 6
Hutchinson & Son, Leicester	3,597 13 0
Major & Son, Leicester	3,530 13 0
Kellett & Son, Leicester	3,534 10 0
Tuffley, Leicester	3,512 2 0
T. & H. Herbert, Leicester	3,479 0 0
Fox, Leicester	3,454 3 0
Bass, Leicester	3,438 1 8
Gimson & Sons, Leicester	3,416 4 3
Riddett, Leicester	3,413 0 0
Mason, L., Leicester	3,382 4 0
Tyers, Leicester	3,367 13 0
Hewitt, Leicester	3,309 0 0
Elliott, Leicester (accepted)	3,307 11 0
Richardson, Leicester	3,145 0 0
Ratnott, Leicester	3,055 9 0

LONDON.—For building factory at Haggerstone, E., for Mr. Becken. Mr. John Hamilton, architect:—

Beale	£2,400 0 0
McCormick	2,346 0 0
Jarvis & Son	2,330 0 0
Mower & Son	2,137 0 0
Godfrey	2,117 0 0
Scott	1,998 0 0
Sharmur	1,994 0 0

LONDON.—For alterations and additions, &c., at 15, Young-street, Kensington, W., for Mr. R. P. Evans. Mr. J. Stevens, architect:—

Wall	£1,095 0 0
Leslie	810 10 0
Prestige & Co	793 0 0
Buckeridge	749 0 0
Cropper	717 10 0
Giles & Co.	649 16 3
Kearley	577 18 0

LONDON.—For the rebuilding of "The Pagoda" public-house, Bermondsey New-road, S.E., for Mr. W. H. Chapman. Mr. J. W. Brooker, architect, 13, Railway-approach, London Bridge, S.E.:—

H. L. Holloway	£3,320 0 0
C. Dearing & Son	3,300 0 0
Outhwaite & Son	3,260 0 0
W. & F. Crosier	3,195 0 0
Burman & Son	3,175 0 0
W. Downs	3,117 0 0
Gill	3,097 0 0
G. J. Kick (accepted)	2,987 0 0

LONDON.—For painting and other works at the Paddington Infirmary, Harrow-road, for the Guardians. Messrs. A. & C. Harston, architects, 15, Leadenhall-street. Quantities not supplied:—

G. & W. Carr	£550 0 0†
F. T. Chinchen	464 18 0
H. C. Clifton	360 0 0
T. Gamage	335 0 0
Collier & Billingharst	340 0 0
C. H. Norbury	338 0 0
W. H. Handover	315 0 0
W. G. Lilly	313 0 0
C. J. Shaw	290 0 0
R. Edwards, jun.	263 0 0
W. Davenport	244 0 0
G. Foxley, Regent-street (accepted)	195 0 0†

LONDON.—For repairs to buildings and furniture to Hamond-square School, Hoxton, N., for the School Board for London:—

Pardoe & Son	£133 0 0
J. W. Nottingham	119 15 0
G. Crawys	117 0 0
Barker	116 0 0

LONDON.—For alterations, repairs, &c., to 16, Cleveland-mews, Hyde Park, W. Mr. W. Jacomb Gibbon, architect, 36, Great James-street, Bedford-row, W.C.:—

Greatorex & Co.	£373 0 0
E. L. Nunn	256 0 0
Macfarlane Bros. (accepted)	218 0 0

LONDON.—For new drains, sanitary improvements, plumbers' work, gas, and decorations, at 65, Warwick-square, Belgravia, S.W. Mr. H. Hardwicke Langston, architect, 9, Great James-street, Bedford-row, London:—

E. D. Hook	£276 0 0
John Smeaton (accepted)	233 0 0

LONDON.—For alterations and repairs at "Highbury Barn Tavern," for Messrs. T. Wright & Sons. Mr. Wm. West, architect, 19, Craven-street, Strand. No quantities supplied:—

Lambie	£360 0 0
Pearman	635 0 0

LONDON.—For additions to University Club, Bethnal-green. Mr. A. H. Thompson, architect:—

E. Triggs, The Chase, Clapham	£1,881 0 0

[No competition].

LONDON.—For decorations and sanitary work to No. 5, Victoria-road, Clapham, for Mr. F. Ridedale:—

E. Triggs, The Chase, Clapham	£161 0 0

[No competition.]

MANSFIELD.—For new Sunday schools, Mansfield, for Methodist Free Church Connexion. Mr. R. Frank Vallance, architect, Mansfield. Quantities supplied by the architect:—

S. & G. Frisby, Mansfield	£1,947 15 0
John Greenwood, Mansfield	1,930 0 0
Evans & Woodcock, Hyson Green, Nottingham	1,924 0 0
Fisher Bros., Mansfield	1,795 0 0
Samuel Dudson, Mansfield	1,791 0 0
Edward Cuddy, Mansfield	1,789 0 0
W. A. Vallance, Mansfield	1,689 0 0

Revised Tenders.

John Greenwood, Mansfield	1,595 0 0
Evans & Woodcock, Hyson Green, Nottingham	1,494 10 0
Fisher Brothers,* Mansfield	1,450 0 0

* Accepted.

MANSFIELD.—For alterations and additions to dwelling-houses, Ratcliffe-gate, Mansfield, for Mr. Gregg. Mr. R. Frank Vallance, architect, Mansfield:—

Saml. Dudson, Mansfield	£397 0 0
Chambers, Paget, & Wass, Sutton-in-Ashfield	363 11 0
Fisher Bros., Mansfield	335 0 0
John Greenwood, Mansfield	330 0 0
John Ashley, Mansfield Woodhouse	317 1 6
Edward Cuddy, Mansfield	310 0 0
S. & G. Frisby, Mansfield	309 0 0
Evans & Sutton, Sutton-in-Ashfield*	236 10 0

* Accepted.

MANSFIELD.—For alterations and additions to Mr. John Rayner's premises, Mansfield. Mr. R. Frank Vallance, architect. Quantities supplied by the architect:—

John Greenwood, Mansfield	£225 0 0
W. A. Vallance, Mansfield	207 10 0
James Evans, Sutton-in-Ashfield	203 9 0
Fisher Bros., Mansfield	200 0 0
Saml. Dudson, Mansfield	193 17 0

MANSFIELD.—For draining, forming, metalling, curbing, and paving Grove-street, Mansfield, for Mansfield Improvement Commissioners. Mr. R. Frank Vallance, Town Surveyor:—

S. & G. Frisby, Mansfield	£547 0 0
J. W. Fisher, Mansfield	506 0 0
J. Bradley, Lincoln	459 4 0
W. A. Vallance, Mansfield (accepted)	413 0 0
John Lane, Skegby (withdrawn)	370 0 0

MANSFIELD.—For new dairy, Market-street, Mansfield, for Mr. Wm. Hollins, jun., J.P. Mr. R. Frank Vallance, architect, Mansfield. Quantities supplied by the architect:—

Saml. Dudson, Mansfield	£873 0 0
S. & G. Frisby, Mansfield	798 0 0
Fisher Bros., Mansfield	759 0 0
W. A. Vallance, Mansfield	730 0 0
John Greenwood, Mansfield*	718 11 8

* Accepted subject to modification.

MANSFIELD.—For pair of semi-detached houses in the Park, Mansfield, for Mr. F. A. Robinson. Mr. R. Frank Vallance, architect, Mansfield:—

Edward Caddy, Mansfield	£1,080 0 0
Fisher Bros., Mansfield	955 0 0
W. A. Vallance, Mansfield	914 0 0
Evans & Sutton, Sutton-in-Ashfield	910 0 0
Samuel Dudson, Mansfield	897 0 0
Evans & Woodcock, Hyson Green, Nottingham	879 0 0
John Greenwood, Mansfield	843 0 0

NEWMARKET.—For building a house and shop in the Station-road, Newmarket, for Mrs. Saich. Mr. Jno. Flatman, architect, Newmarket:—

Simpson & Son,* Newmarket	£725 0 0

[Six tenders sent in.]
* Accepted.

NEW SOUTHGATE.—For alterations and additions to the "Alexandra" Arms, New Southgate, for Mr. C. A. Worrall:—

Wheatley	£498 0 0
Voller	259 0 0
Eaton	215 0 0

[Surveyor's estimate, £248.]

NOTTINGHAM.—For the formation of roads, and laying sewers, &c., on the Cavendish-hill Freehold Land Society's Estate, Nottingham. Messrs. Hoxsell & Son, surveyors, Nottingham. Quantities supplied:—

H. Keeling	£548 0 0
Holmes Bros.	500 0 0
John Hawley & Son, Ilkeston	469 10 0
E. Cope	452 8 6
Samuel Thumbs	449 0 0
W. Frost	435 10 0
Arthur Morris, Carlton	345 0 0
Jas. F. Price (accepted)	310 0 0

[The rest of Nottingham.]

OLTON (Warwickshire).—For rebuilding a farm-house at "The Holleries," near Olton, Warwickshire. Mr. Edward Turner, architect, 21, Hart-street, Bloomsbury-square, London:—

Thos. Smith, Birmingham	£657 0 0
J. Barnsley & Sons, Birmingham	648 0 0
Bragg Bros., Solihull	604 0 0

POTTERS BAR.—For new forcing-house and heating arrangements. Messrs. Benison & Bargeman, architects:—

E. Trigg, The Chase, Clapham	£155 5 0

[No competition.]

RICHMOND (Surrey).—For road materials for use in the town of Richmond, Surrey. Mr. Walter Brooke, A.M.I.C.E., Town Surveyor:—

	A**	B†	C‡	D§	E‖
H. Covington, Battersea	—	—	—	4 0	4 3
E. Downs, Richmond	13 3*	—	—	4 1*	4 2*
R. L. & J. Fennings, London Bridge	14 10	—	—	—	—
W. Griffiths, Kingsland	14 11	—	—	—	—
J. Hereford, Faversham	—	—	—	—	4 6
A. & F. Mannelle, City	14 10	—	—	—	—
Nowell & Robson, Kensington	14 9	—	—	—	—
G. Pearce, Brentford	—	—	—	5 0	4 5
J. Runnalls, Penzance	—	12 9*	10 6*	—	—
T. Turner & Sons, Chelsea	14 7	—	—	—	—

* Accepted.
** Broken blue Guernsey granite, per cubic yard.
† Broken Penlee stone, per cubic yard.
‡ Broken Penlee stone siftings, per cubic yard.
§ Broken chalk flints per cubic yard.
‖ Broken brown or pit flints, per cubic yard.

TOTTENHAM.—For erecting St. Mary's Vicarage, for the Marlboro' College Mission. Messrs. J. R. K. & J. P. Cutts, architects, 28, Southampton-street, Strand, W.C.:—

M. A. Humphreys & Son, Tottenham	£2,310 0 0
Gould & Brand, Camden-town	2,193 0 0
James Holloway, Lavender-hill	2,059 0 0
Thomas Taylor, Kingsland-road	1,997 0 0
John Tyerman, Walworth-road	1,997 0 0
Arthur Porter, Tottenham	1,807 0 0

WALTHAMSTOW.—For the erection of a new mission hall at Higham Hill, Walthamstow, for the Rev. W. Douglass. Mr. W. A. Longmore, architect, Bridge-chambers, Walthamstow:—

Green & Lee	£725 0 0
Bosley & Son	646 10 0
Fuller	583 0 0
Challis	565 0 0
Reed	529 0 0
Scott	513 0 0

WEST WICKHAM.—For house and stables at Hawes Farm, West Wickham, for Mr. Packe. Mr. A. R. Stenning, architect. Messrs. Young & Brown, surveyors:—

	House.	Stables.
Smith	£2,880	£740
Crossley	2,758	650
Mid-Kent Building Works, Ltd.	2,725	579
Lynn & Duncan	2,689	621
Cooper	2,500	610
Sabey & Son	2,498	570
Palmer (accepted)	2,430	566

WEST WICKHAM.—For stable and coach-house, at Wood Lodge, West Wickham, for Sir J. F. Lennard, Bart. Mr. A. R. Stenning, architect. Messrs. Young & Brown, surveyors:—

Smith	£1,120 0 0
Cooper	1,010 0 0
Crossley	990 0 0
Sabey & Son	895 0 0
Palmer	885 0 0
Lynn & Duncan	867 0 0
Mid-Kent Building Works, Ltd., Beckenham (accepted)	859 0 0

Alterations and Repairs, Shortlands.—In last week's *Builder*, p. 128, for "J. Watson, Dulwich, accepted," read "T. Watson," &c.

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TO CORRESPONDENTS.

St. Thomas, Charterhouse (such notices are hardly within our *matter*).—H. M. (we cannot go further into the subject at present).—D. R. (thanks).—R. D. R. (attended to).—H. H. L.—M. & Co.—A. W. E. (we should say the younger members would be much more benefited by travelling in the company of the elder ones).—T. W. A. (too late).—H. I. N. (ditto).—C. W. B. & Co. (ditto).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

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